

# THE ACROMETOPAE OF THE ETHIOPIAN REGION: A REVISION, WITH NOTES ON THE SEXUAL DIMORPHISM SHOWN BY THE GROUP (ORTHOPTERA: TETTIGONIIDAE)

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## SYNOPSIS

The African genera of the Phaneropterine group Acrometopae are fully revised. The names for these genera are reduced in number by new synonymy from fourteen to three, and in addition two new genera are described. Keys are given to the genera and species. It is shown that the two sexes of several of the species have hitherto been placed in different genera and in many cases in different species. Fourteen specific names have been newly synonymized and nine new species are described.

## INTRODUCTION

THIS revision covers all the species of Phaneropterinae which have been described or included in *Horatosphaga* Schaum, *Conchotopoda* Karsch, *Peronura* Karsch, *Plegmatoptera* Karsch, *Pantolepta* Karsch, *Rhegmatopoda* Brunner, *Pachypyga* Karsch, *Euthyphlebia* Schulthess, *Thaumatoxenina* Kirby, *Keniicola* Sjöstedt, *Schulthessinia* Sjöstedt, *Pachypygiana* Strand, *Eupantolepta* Bolivar, and *Plegmatia* Uvarov. Of these generic names, all but the first three are newly synonymized: *Rhegmatopoda* Brunner with *Conchotopoda* Karsch, and the remaining ten with *Horatosphaga* Schaum.

The group-name Acrometopae is used here in the sense in which it was used by Brunner (1891, p. 5). It is not pretended that it is a satisfactory taxonomic unit, but it has nevertheless a use of convenience for a group of Phaneropterinae which

probably had a monophyletic origin. This group may be characterized by the lack of a fore coxal spine, biconchate fore tibiae, sloping fastigium of the vertex, reduced or vestigial hind wings in the female, and at least some stridulatory modification of the male fore wings *outside* the stridulatory organ itself (i.e. modifications anterior or distal to the cubital and anal areas). In the case of the European genus *Acrometopa* Fieber the basal part of the radial area of the male fore wings is somewhat modified in connection with stridulation, but in the remaining Acrometopae, which are all African, it is the basal regions of areas MA and Cu<sub>1a</sub> which are primarily involved (though in *Horatosphaga* Schaum the entire male fore wings typically show a modified, web-like venation). In *Peronura* Karsch the male fore wings are too reduced to show this specialization clearly, but some basal modification of area MA is still apparent. *Lamecosoma* gen. n. is not a very close relative of the other genera of Acrometopae, but has clear affinities with the group and is included here for convenience.

Perhaps the chief feature of interest of the group is the high degree of sexual dimorphism shown by many of the species. It is in the genus *Horatosphaga* Schaum that the difference between the sexes reaches its greatest expression. The intersexual differences in this genus are often of the same order as differences between genera in other Phaneropterinae. The shape of the head, pronotum, and hind femora, is in several species quite different in the two sexes, and the venation of the male fore wings often bears no resemblance to that of the female.

It is because of these great differences (enhanced by geographical variation) that the forty-three specific names hitherto known in the African Acrometopae were divided amongst fourteen generic names, eleven of which are here newly synonymized. In two of the most common and widespread species of *Horatosphaga* Schaum (*H. serrifera* Schaum and *H. leggei* (Kirby)) the two sexes have been placed in different genera, and this is also true of the less widespread species *H. somali* (Schulthess). A brief history of the chaotic state of affairs which has resulted from this type of confusion is given below.

The genus *Horatosphaga* was erected by Schaum in 1853 for a female specimen, which he named *H. serrifera*. No further species of the group was described until 1887, when Karsch erected the genus *Conchotopoda* for a new species *C. belcki* Karsch. In the following year Karsch erected the genus *Peronura* for two new species *P. clavigera* Karsch (subsequently selected as type species by Kirby, 1906) and *P. hildebrandtiana* Karsch (see p. 320).

During the next thirty-five years nine further generic names were proposed for African Acrometopae, but only the three genera mentioned above are given separate status in this revision. In 1888 Karsch erected the two further genera *Plegmatoptera* and *Pantolepta*. *Plegmatoptera* Karsch was based on *P. reticulata* Karsch, known only by the unique female holotype. This species clearly belongs to *Horatosphaga* Schaum and the holotype is quite possibly a female of one of the species of this genus which are known only by males (e.g. *H. regularis* (Bolivar), see p. 307); the exact identity of this species will remain obscure until undoubted males are available. *Pantolepta* Karsch was based on *P. heteromorpha* Karsch, which is undoubtedly congeneric with *H. serrifera* Schaum.

*Rhegmatopoda* was erected by Brunner in 1891 for *Horatosphaga leptocerca* Stal, 1876. For reasons stated on p. 326, however, it has become clear that *Rhegmatopoda* Brunner is a synonym of *Conchotopoda* Karsch.

In 1893 Karsch erected the genus *Pachyphyga* for a new species *P. inclusa* Karsch. The claims for separate status of this genus rest solely on the male genitalia. However, the enlarged male tenth abdominal tergite and subgenital plate of *P. inclusa* Karsch merely represent an intermediate stage between the relatively simple type of male genitalia found in *H. serrifera* Schaum, for example, and the highly modified tenth abdominal tergite and subgenital plate of the males of such species as *H. ruspolii* (Schulthess) and *H. diminuta* (Chopard). The male cerci are of exactly the same type in all these species and the females differ by no character of taxonomic importance at the generic level. The wing-venation of all these species shows clearly their close affinities with each other, and in my opinion it would be most inadvisable to segregate these different stages of male genitalic development into different genera. This progressive enlargement of the tenth abdominal tergite and subgenital plate of the males is closely similar to the trend shown by *Phaneroptera* Serville, in which every intermediate stage is shown and in which again the females show no parallel development of taxonomic significance (see Ragge, 1956, p. 213). Enlargements of various parts of the male genitalia are not uncommon in the Phaneropterinae and, though providing excellent specific characters, do not form a suitable basis for segregating species into genera.

In 1898 Schulthess erected the genus *Euthyphlebia* for a new species *E. parallela* Schulthess. This specific name is, however, a synonym of *Horatosphaga heteromorphia* (Karsch) (see p. 298), the type species of *Pantolepta* Karsch, and the name *Euthyphlebia* Schulthess must therefore be rejected. The genus *Thaumatoxenia* was erected by Kirby in 1909 for *Th. leggei* Kirby; this species clearly belongs to *Horatosphaga* Schaum, being closely related to its type species *H. serrifera* Schaum. *Keniicola* Sjöstedt, 1912, was based on *K. gracilis* Sjöstedt, which is also without doubt congeneric with *Horatosphaga serrifera* Schaum. In the same paper in which *Keniicola* Sjöstedt was erected, Sjöstedt proposed the new genus *Schulthessinia* for *Conchotopoda ruspolii* Schulthess. Sjöstedt's grounds for regarding this species as being generically distinct were solely the much modified male genitalia, and it was this character alone which was described in the original description of the genus. This genitalic development takes the extreme form mentioned in the last paragraph above, and to which the male genitalia of *Horatosphaga inclusa* (Karsch) and *H. crosskeyi* sp. n. (p. 318) form an intermediate stage; for the reasons stated in the same paragraph this character cannot be regarded as being of generic value, and *Schulthessinia* Sjöstedt is therefore synonymized in the present work.

The genus *Eupantolepta* was erected by Bolivar in 1922 for a new species *E. regularis* Bolivar. As will be shown on p. 307 the exact status of this species is still in some doubt, but it is quite certain that it represents a normal and unmodified member of the genus *Horatosphaga* Schaum.

Finally, two new names have been proposed for genera of African Acrometopae whose original names were preoccupied. Unfortunately both these original names are synonymized here with *Horatosphaga* Schaum, so that the new names must

also be added to the synonymy of this genus. The first is *Pachypygiana* Strand, 1921, which was to replace *Pachypyga* Karsch, 1893 (preoccupied by *Pachypyga* Steinheil, 1873, Coleoptera), and the second is *Plegmatia* Uvarov, 1940, which was proposed in place of *Plegmatoptera* Karsch, 1888 (preoccupied by *Plegmatoptera* Spinola, 1839, Hemiptera).

It is a remarkable fact that all the generic synonyms discussed above were based on relatively unspecialized species of *Horatosphaga* Schaum, which few modern workers would deny are congeneric. Even in the species where the male genitalia have become greatly modified, the facies is identical to the species with more generalized genitalia. For example, if one takes males of the three species *Horatosphaga elongata* (Rehn) (normal genitalia), *H. crosskeyi* sp. n. (modified genitalia), and *H. ruspolii* (Schulthess) (highly modified genitalia), they might almost be taken to be the same species if the genitalia were ignored: the wing-venation (usually the best specific character), pronotum, femoral armature, coloration, and dimensions, are all very similar. There are, however, a number of aberrant species which fit much less readily into *Horatosphaga* Schaum, though having closer affinities with this genus than with any other genus of Acrometopae. These species are *H. nuda* sp. n., *H. meruensis* (Sjöstedt), *H. nomima* (Karsch), *H. montivaga* (Sjöstedt), and *H. elgonis* (Chopard). The second of these species was described in *Plegmatoptera* Karsch and the last three in *Peronura* Karsch. In the males of all these species the fore wings are somewhat reduced and the hind wings are rudimentary. The characteristic web-like venation shown by the male fore wings of *Horatosphaga* Schaum has been almost or entirely lost and the general appearance (partly as a result) has diverged from the usual generic facies. All these species, however, show indisputable evidence in the male wing-venation of their derivation from stock more typical of *Horatosphaga* Schaum: they all show, either clearly or in a reduced state, the basal modifications of areas MA and Cu<sub>1a</sub> which are characteristic of that genus, whilst not showing the fold at the base of the medial vein which characterizes *Conchotopoda* Karsch.

In the case of *H. nuda* sp. n. and *H. meruensis* (Sjöstedt) the basal region of the male fore wings is quite normal for *Horatosphaga* Schaum, only the more distal part having become reduced. In *H. nomima* (Karsch) and *H. montivaga* (Sjöstedt) (which are closely interrelated) the reduction of the fore wings is more advanced and the basal vein-pattern has begun to be obscured. In *H. elgonis* (Chopard) the reduction also affects the whole of the fore wings, but the male genitalia are considerably modified and this species has evidently arisen quite independently from *H. nomima* (Karsch) and *H. montivaga* (Sjöstedt). If, therefore, these forms with reduced fore wings were given separate generic status, it would be necessary to put them in three different genera, all of which would have to be given new names. These genera would be almost impossible to define, both in relation to each other and in relation to the restricted concept of *Horatosphaga* Schaum. It is, moreover, quite possible that further species will be discovered showing various other stages of wing-reduction, in which case the small gaps which might now provide grounds for generic separations would quite probably be bridged. In this revision the five species under discussion have, therefore, all been included in *Horatosphaga* Schaum. The genus, as it then

stands, admittedly contains a rather heterogeneous assemblage of species, at least as far as the males are concerned, but it is the author's view that this is at present unavoidable.

The segregation of the remaining African Acrometopae is also a matter of some difficulty. The species *calaharica* Karny and *splendens* sp. n. seem to represent relics of a form ancestral to both *Conchotopoda* Karsch and *Horatosphaga* Schaum, and I have erected for them the genus *Prosphega* gen. n. This genus is clearly more primitive than any of the other African Acrometopae, the male fore wings showing neither the fold at the base of M which is diagnostic of *Conchotopoda* Karsch, nor the web-like pattern of cross-veins which characterizes *Horatosphaga* Schaum, and the general facies of this sex not having developed the extremely attenuate form of *Lamecosoma* gen. n. That *Prosphega* gen. n. is not an offshoot from *Horatosphaga* Schaum which has partially lost the wing-specializations of the latter genus is shown by the fact that in the female fore wings of *P. calaharica* (Karny) the base of MP is well developed, as is usual in the Tettigoniidae; in *Horatosphaga* Schaum the basal part of MP (before its fusion with  $Cu_{1a}$ ) is either lost or represented by an oblique cross-vein.

I have erected the genus *Lamecosoma* gen. n. for a remarkable new species *tenuis* sp. n. As mentioned earlier this species shows clear affinities with the other African Acrometopae, but the relationship has been obscured by the extreme attenuation of the body and limbs.

Kirby (1906) listed nine genera of African Acrometopae, containing a total of nineteen species. In the present work five genera are recognized, containing a total of thirty-three definite species and two whose status remains uncertain. Two genera and nine species are new. There are eleven generic synonyms and fourteen definite specific synonyms; all these are newly established. Four further specific names are probably synonyms but cannot at present be definitely established as such. The total number of specific names involved in the African Acrometopae is now fifty-three.

Access was gained to all the existing type specimens except for four in the Museo Civico di Storia Naturale, Genoa; photographs, drawings, and descriptions of these four types were sent through the great kindness of Dr. F. Capra. The holotype of *Conchotopoda belcki* Karsch is lost.

#### ACKNOWLEDGMENTS

I must extend my most sincere thanks to the following specialists who have spared time and energy to send me type specimens and other material from their respective museums:

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## MATERIAL

In addition to the collection of African Acrometopae in the British Museum (Natural History) material was lent by the sources listed below, through the courtesy of the specialists acknowledged above.

Musée du Congo Belge, Tervuren ; Naturhistorisches Museum, Vienna ; Muséum National d'Histoire Naturelle, Paris ; South African Museum, Cape Town ; Universitetets Zoologiska Institution, Lund ; Naturhistoriska Riksmuseum, Stockholm ; University Museum, Oxford ; Academy of Natural Sciences, Philadelphia ; Zoologisches Museum of the Humboldt-Universität, Berlin.

## TREATMENT

The general treatment adopted is the same as in my revision of *Phaneroptera* Serville (Ragge, 1956) and most of the remarks given on pp. 208 and 209 of that paper apply here. The wing-vein nomenclature used (see Text-fig. 2) is that of Ragge (1955). Statements about the relative lengths of the fore and hind wings assume that these organs are flexed. In all cases except *Peronura clavigera* Karsch the expression "total length" refers to the distance from the most anterior part of the head to the tips of the flexed wings (whichever pair extends furthest backwards) ; in *P. clavigera* Karsch, which is very brachypterous, this measurement has to take the tip of the subgenital plate as its posterior termination, and is therefore of limited value.

## SEXUAL DIMORPHISM

The confusion in which the African Acrometopae have always been has resulted mainly from the high degree of sexual dimorphism shown by the group. In the more typical species of *Horatosphaga* Schaum the differences between the sexes are of the order of generic differences in other Phaneropterinae. It has thus been most difficult to associate the males with the females in any one species, and in some species this still remains to be done.

In the more common species series of both sexes were available which had been collected at the same time and place : in these cases the association of the two sexes was comparatively simple. In other cases, in which the species have been poorly collected and, especially, in which the females have become markedly brachypterous, the correlation of males with females was extremely difficult and is still in some doubt.

This is particularly true of the two species *H. somali* (Schulthess) and *H. ruspolii* (Schulthess), in both of which the males are fully winged and the females are apparently very brachypterous. The head, pronotum, and legs, also show quite large differences, and in fact the two sexes seem to have lost any resemblance to each other. In neither of these species have series of specimens containing both sexes and bearing identical data been available. The females have been associated with the males tentatively, on the grounds of being collected in the same locality and showing certain resemblances in coloration.

Some of the more usual differences between the sexes in *Horatosphaga* Schaum may be seen in Text-fig. 1. It will be noticed that the head of the female is "stretched" downwards in comparison with the male, and the vertex, in consequence, is more prolonged and slopes more steeply to the frons. The pronotum is not so distinctly selliform as in the male and does not have the inflated region ("humeral sinus") in the posterior region of each lateral lobe. The female has more robust legs than the male, this being particularly noticeable in the case of the hind femur. The tympanic auricles of the fore tibiae are also not inflated in the way that the male ones are. The fore wings of the female are coarse in texture and have not undergone the very characteristic, rather web-like modification in venation shown

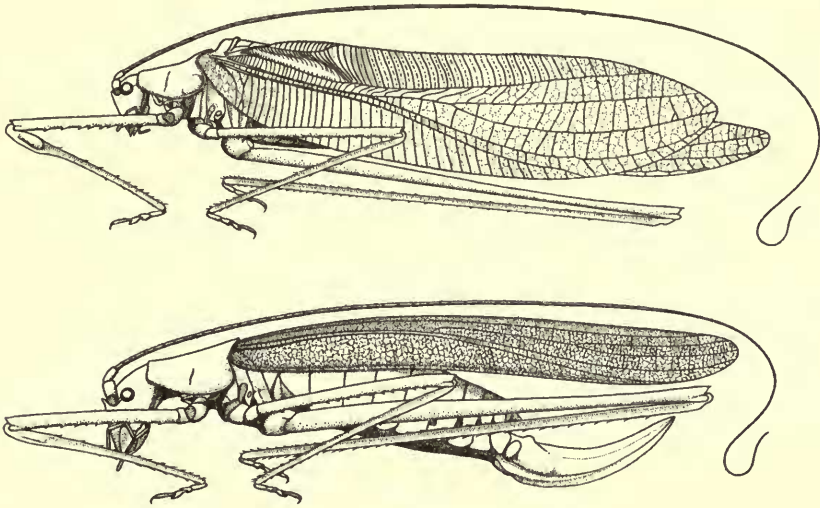


FIG. 1. *Horatosphaga media* sp. n., male (above) and female.

by the male fore wings. As in all the Acrometopae the female has no hind wings, whereas in the male of the species illustrated, *H. media* sp. n., and of many other Acrometopae, the hind wings are fully developed. Although the general body-size of the female is greater than that of the male in the Acrometopae, both the hind femora and fore wings are almost always smaller than their male counterparts.

As can be seen from the foregoing remarks the differences between the sexes are considerable, and in other groups of Phaneropterinae would suggest that different genera were involved. Many of the genera of Acrometopae which have been hitherto recognized were known by only one of the sexes; the other sex was often presumed to be similar. It is because of this that Chopard (1954), in the most recent key to the African genera of Phaneropterinae, characterizes six genera of Acrometopae as having the hind wings "bien développées dans les deux sexes", whereas in fact the females of all these genera are now known to have no hind wings.

In spite of the great intersexual differences the females of some species show a tendency to follow the same evolutionary trends as the males. For example, in

*H. heteromorpha* (Karsch) both sexes are rather attenuate, and indeed this is the only species of Acrometopae in which the female fore wings are longer than those of the male. Where the males have reduced fore wings their hind wings are either much abbreviated or absent, and the resemblance between the sexes is much closer. In species such as *H. meruensis* (Sjöstedt), *H. montivaga* (Sjöstedt), and *H. elgonis* (Chopard), in which the fore wings are reduced and various other modifications have taken place, the females resemble the males quite closely and the correspondence between the sexes is unmistakable. The reduction of the wings in the male sex is often accompanied by a change in shape of the head, pronotum, and legs, towards the female type. Thus the pronotum tends to lose its selliform shape, the vertex slopes more steeply, the hind femora become more robust, and the inflation of the tympanic auricles is less pronounced. It is probable that the selliform pronotum and less robust legs are associated with the ability to fly and that the difference in the degree of inflation of the tympanic auricles is due to the fact that only the males stridulate.

#### KEY TO THE GENERA

Females are unknown in *Lamecosoma* gen. n., and in *Conchotopoda* Karsch and *Prosphaga* gen. n. this sex is in each case known by only one specimen of one species. It is therefore impossible at present to include the female sex in the key to genera, especially as the females are so lacking in characters of taxonomic significance. It should be noted, however, that females with fore wings barely longer than the pronotum, or even shorter, belong to *Peronura* Karsch, and that the females of *Lamecosoma* gen. n. probably have fore wings more than seven times longer than their maximum width. Any female specimen of Acrometopae not belonging to these two genera and coming from between latitudes 5° N. and 20° S. is almost certainly a member of the genus *Horatosphaga* Schaum; this also applies to any West African female.

#### Males

1. Fore wings less than twice the length of the pronotum . . . . . *Peronura* Karsch (p. 320)
- . Fore wings more than twice the length of the pronotum. . . . . 2
2. Body very attenuate, as in Text-fig. 3, the fore wings more than seven times longer than their maximum width . . . . . *Lamecosoma* gen. n. (p. 331)
- . Body less attenuate, not as in Text-fig. 3, the fore wings less than seven times longer than their maximum width . . . . . 3
3. Basal region of M in the right fore wing developed into a heavily sclerotized posterior fold, forming a pocket next to the stridulatory organ, as in Text-fig. 4, and appearing as an opaque patch when the fore wing is extended, as in Text-figs. 5–10. . . . . *Conchotopoda* Karsch (p. 325)
- . Basal region of M in the right fore wing not modified as above, and not appearing as an opaque patch when the fore wing is extended . . . . . 4
4.  $R_s$  of the fore wings (or its branches) ending at, or slightly in front of, the tip of the wing, as in Text-figs. 11–40. Cross-veins of area MA arranged in a regular, closely parallel fashion, or, if arranged irregularly, hind wings absent . . . . . *Horatosphaga* Schaum (p. 278)
- .  $R_s$  of the fore wings (or its branches) ending slightly behind, not actually at, the tip of the wing, as in Text-figs. 41 and 42. Cross-veins of area MA not arranged in a regular, closely parallel fashion. Hind wings fully developed . . . . . *Prosphaga* gen. n. (p. 322)



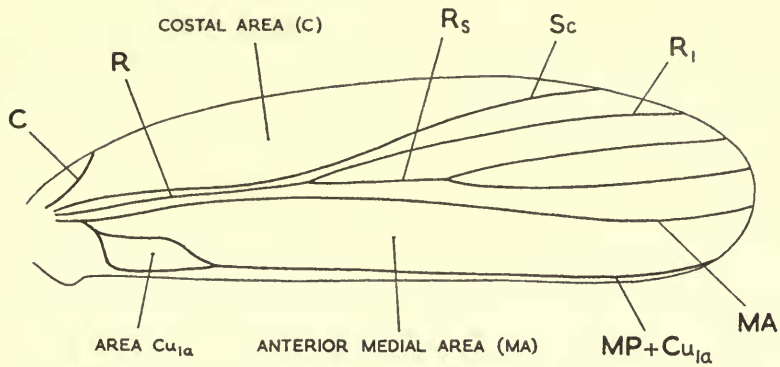


FIG. 2. Diagram showing the arrangement of the principal veins and areas in the male fore wing of a typical member of the African Acrometopae.

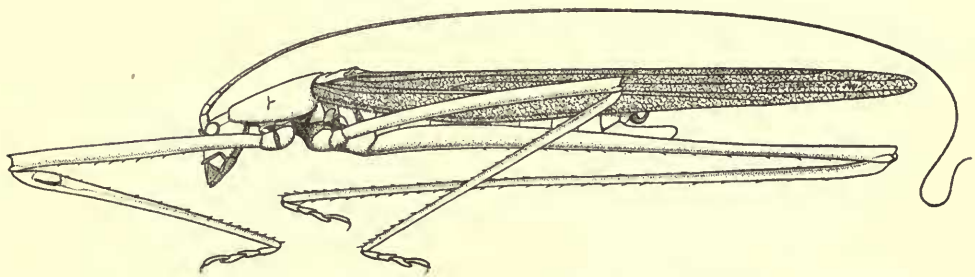


FIG. 3. *Lamecosoma tenuis* gen. et sp. n., male.

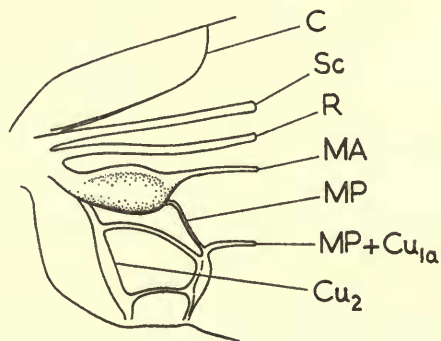
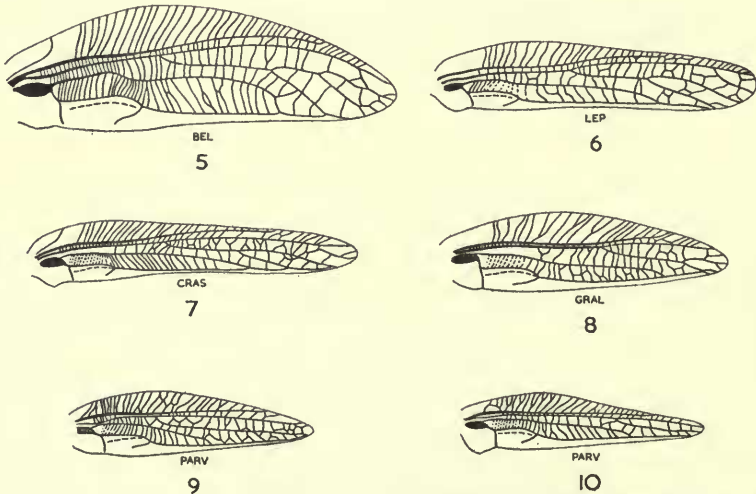


FIG. 4. The basal part of the right male fore wing of *Conchotopoda belcki* Karsch.

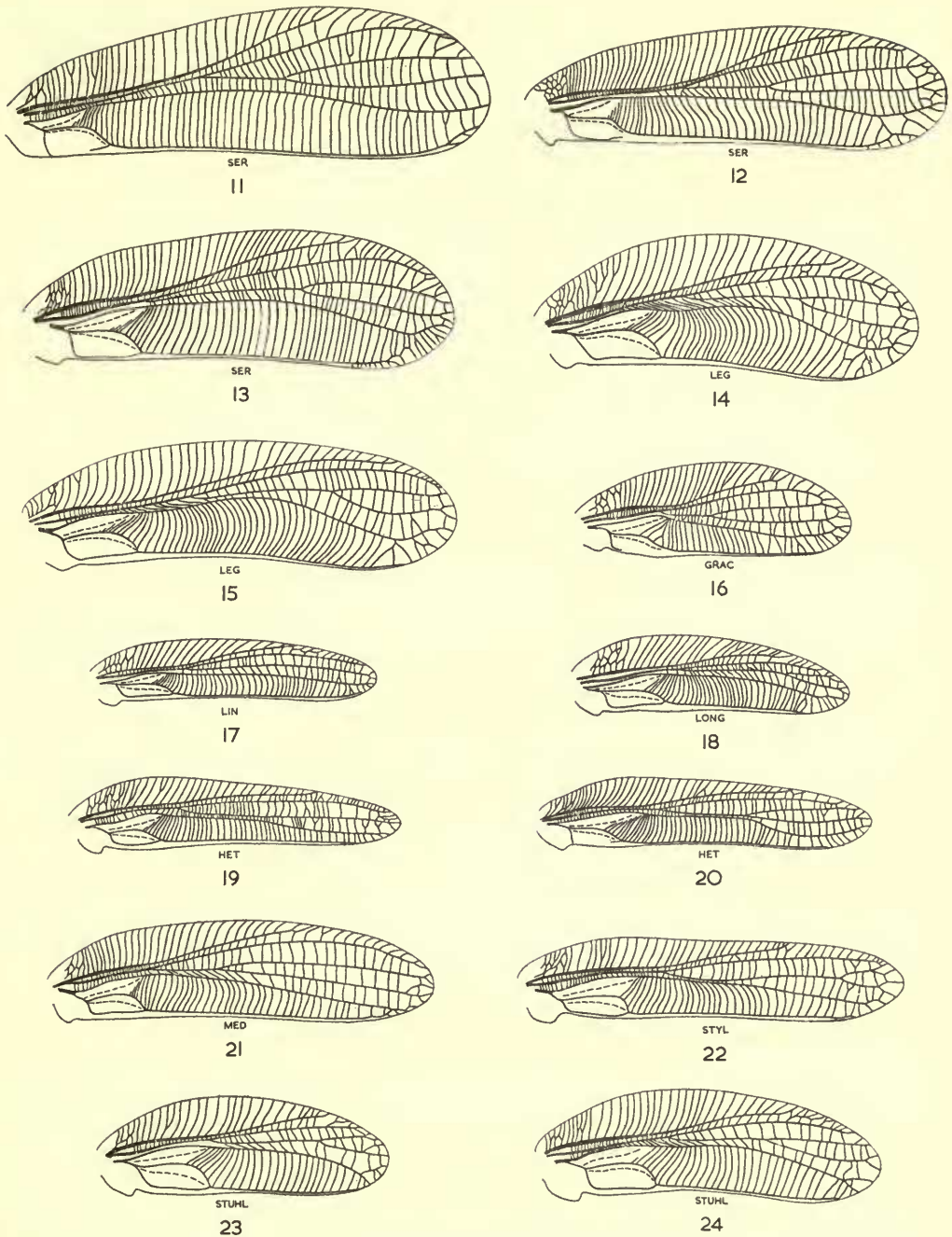
## HORATOSPHAGA Schaum, 1853

- Horatosphaga* Schaum, 1853, *Ber. Preuss. Akad. Wiss. Berlin*, 1853 : 777. Type species, by monotypy, *Horatosphaga serrifera* Schaum, 1853.
- Plegmatoptera* Karsch, 1888, *Berl. ent. Z.* 32 : 429. Type species, by monotypy, *Plegmatoptera reticulata* Karsch, 1888. **Syn. n.**
- Pantolepta* Karsch, 1888, *Berl. ent. Z.* 32 : 429. Type species, by monotypy, *Pantolepta heteromorpha* Karsch, 1888. **Syn. n.**
- Pachypyga* Karsch, 1893, *Berl. ent. Z.* 38 : 124. Type species, by monotypy, *Pachypyga inclusa* Karsch, 1893. **Syn. n.**
- Euthyphlebia* Schulthess, 1898, *Ann. Mus. Stor. nat. Genova*, 39 : 204. Type species by monotypy, *Euthyphlebia parallela* Schulthess, 1898. **Syn. n.**
- Thaumatoxenia* Kirby, 1909, *Trans. zool. Soc. Lond.* 19 : 65. Type species, by monotypy, *Thaumatoxenia leggei* Kirby, 1909. **Syn. n.**
- Keniicola* Sjöstedt, 1912, *Ark. Zool.* 7 (38) : 13. Type species, by monotypy, *Keniicola gracilis* Sjöstedt, 1912. **Syn. n.**
- Schulthessinia* Sjöstedt, 1912, *Ark. Zool.* 7 (38) : 15. Type species, by original designation, *Conchotopoda ruspolii* Schulthess, 1898. **Syn. n.**
- Pachypygiana* Strand, 1921, *Ent. Z.* 34 : 106. Nom. n. for *Pachypyga* Karsch, 1893 (nec Steinheil, 1873). **Syn. n.**
- Eupantolepta* Bolivar, 1922, *Voy. M. Rothschild E. Afr. Anim. Art.* 1 : 200. Type species, by monotypy, *Eupantolepta regularis* Bolivar, 1922. **Syn. n.**
- Plegmatia* Uvarov, 1940, *Ann. Mag. nat. Hist.* (11) 6 : 116. Nom. n. for *Plegmatoptera* Karsch, 1888 (nec Spinola, 1839). **Syn. n.**



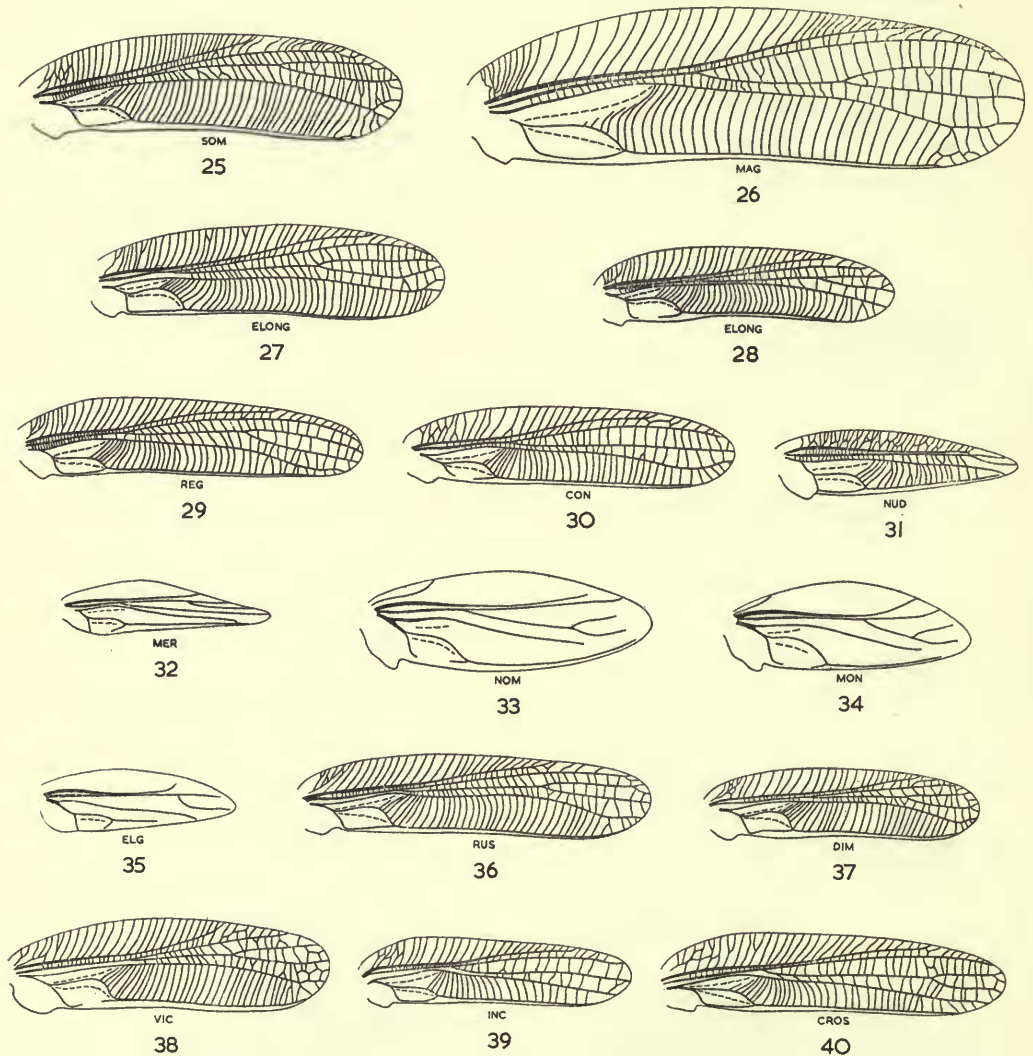
FIGS. 5-10. The right male fore wing of (5) *Conchotopoda belcki* Karsch ; (6) *C. leptocerca* (Stal) ; (7) *C. crassicauda* sp. n. ; (8) *C. gallatoria* (Stal) ; (9) *C. parva* sp. n. (Orange Free State) ; (10) *C. parva* sp. n. (Pretoria).

DIAGNOSIS. ♂. Basal part of area MA of fore wings developed into longitudinal concavity with reduced venation, as in Text-fig. 43 ; area  $Cu_{1a}$  basally



FIGS. 11-24. The right male fore wing of (11) *Horatosphaga serrifera* Schaum (Nyasaland); (12) *H. serrifera* Schaum (Northern Rhodesia); (13) *H. serrifera* Schaum (Angola); (14) *H. leggei* (Kirby) (Belgian Congo); (15) *H. leggei* (Kirby) (Tanganyika); (16) *H. gracilis* (Sjöstedt); (17) *H. linearis* (Rehn); (18) *H. longipes* (Bolivar); (19) *H. heteromorpha* (Karsch) (Northern Kenya); (20) *H. heteromorpha* (Karsch) (Mombasa); (21) *H. media* sp. n.; (22) *H. stylifera* (Karny); (23) *H. stuhlmanni* (Karsch) (Rutshuru); (24) *H. stuhlmanni* (Karsch) (Mahagi Port).

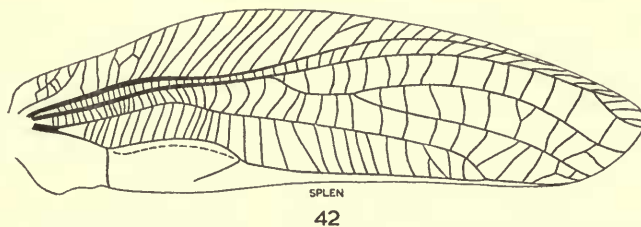
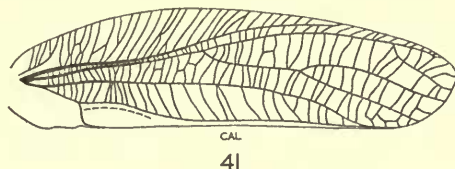
enlarged, as in Text-fig. 43. Cross-veins of fore wings (especially in costal and anterior medial areas) arranged in closely parallel fashion, forming web-like pattern, except in few brachypterous species.  $R_s$  of fore wings (or its branches) ending at tip of wing. Fastigium of frons reaching almost to top of antennal scrobes. Tympanic auricles of fore tibiae often inflated.



FIGS. 25-40. The right male fore wing of (25) *Horatosphaga somali* (Schulthess); (26) *H. magna* sp. n.; (27) *H. elongata* (Rehn) (Usumbura); (28) *H. elongata* (Rehn) (Kahondo); (29) *H. regularis* (Bolivar); (30) *H. concava* sp. n.; (31) *H. nuda* sp. n.; (32) *H. meruensis* (Sjöstedt); (33) *H. nomima* (Karsch); (34) *H. montivaga* (Sjöstedt); (35) *H. elgonis* (Chopard); (36) *H. ruspolii* (Schulthess); (37) *H. diminuta* (Chopard); (38) *H. vicina* (Chopard); (39) *H. inclusa* (Karsch); (40) *H. crosskeyi* sp. n.

♀. No known diagnostic character.

DESCRIPTION. ♂. Fastigium of frons reaching almost to top of antennal scrobes. Fastigium of vertex compressed, sloping to frons, sulcate above.



FIGS. 41 and 42. The right male fore wing of (41) *Prosphaga calaharica* (Karny); (42) *P. splendens* sp. n.

Pronotum without lateral carinae. Fore coxae without spine. Tympanic auricles of fore tibiae often inflated. Cross-veins of fore wings (especially in costal and anterior medial areas) arranged in closely parallel fashion, forming web-like pattern, except in few brachypterous species. Basal part of area MA of fore wings developed into longitudinal concavity with reduced venation, as in Text-fig. 43;

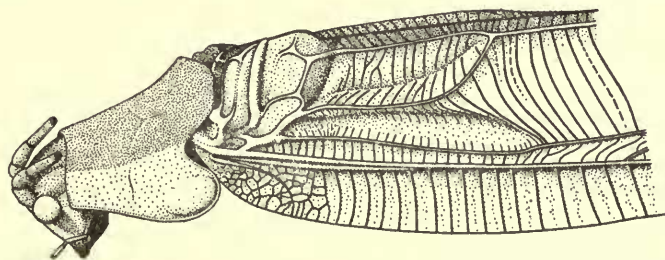


FIG. 43. Dorso-lateral view of the head, pronotum and basal part of the fore wings of *Horatosphaga media* sp. n.

area  $Cu_{1a}$  basally enlarged, as in Text-fig. 43.  $R_s$  of fore wings (or its branches) ending at tip of wing.

♀. As male except for following characters. Fastigium of vertex sloping steeply to frons. Pronotum sometimes with lateral carinae in metazona. Tympanic auricles of fore tibiae not inflated. Fore wings unmodified. Hind wings rudimentary.

DISCUSSION. It is in males of the genus *Horatosphaga* Schaum that the stridulatory specializations of the fore wings which typify the Acrometopae reach their fullest expression. A general picture of these modifications may be gained from Text-fig. 1. It will be seen that a longitudinal groove has developed at the base of area MA and that the cross-veins of areas C and MA have become arranged in a closely parallel fashion.

It is also in this genus that the sexual dimorphism which is shown by all the Acrometopae reaches its extreme form. The type of intersexual differences shown by the more typical members of *Horatosphaga* Schaum is shown in Text-fig. 1. In species such as *H. somali* (Schulthess) and *H. ruspolii* (Schulthess), in which fully winged males are associated with brachypterous females, the difference is further enhanced, and indeed the two sexes bear little resemblance to each other.

At the present stage of our knowledge of the genus, where a number of species is known by the male sex only and in which several species doubtless remain to be described, it would be premature to segregate the species into formal groups. Moreover, it is possible that when further material permits a more extensive study of the group it will be found desirable to put some of the species into distinct genera. In an attempt, however, to give some idea of the interrelationships of the known species of *Horatosphaga* Schaum, I give below a list of them grouped according to their more obvious affinities.

(a) Typical members of the genus :

- H. serrifera* Schaum
- H. leggei* (Kirby)
- H. gracilis* (Sjöstedt)
- H. linearis* (Rehn)
- H. longipes* (Bolivar)
- H. heteromorpha* (Karsch,
- H. media* sp. n.
- H. stylifera* (Karny)
- H. stuhlmanni* (Karsch)
- H. somali* (Schulthess)
- H. magna* sp. n.
- H. elongata* (Rehn)
- H. regularis* (Bolivar)
- H. concava* sp. n.

(b) Species in which the males have no hind wings and narrow, reduced fore wings :

- H. nuda* sp. n.
- H. meruensis* (Sjöstedt)

(c) Species in which the males have no hind wings and broad, reduced fore wings :

- H. nomima* (Karsch)
- H. montivaga* (Sjöstedt)

(d) Species in which the males have no hind wings, reduced fore wings, and a somewhat enlarged tenth abdominal tergite :

*H. elgonis* (Chopard)

(e) Species in which the males (which may or may not have hind wings) have a greatly enlarged, usually knob-like, tenth abdominal tergite :

*H. ruspolii* (Schulthess)

*H. diminuta* (Chopard)

*H. vicina* (Chopard)

*H. inclusa* (Karsch)

*H. crosskeyi* sp. n.

DISTRIBUTION (Text-fig. 44). Although *Horatosphaga* Schaum covers the whole of tropical Africa except for the dry northern fringe formed by the Sahara Desert, it is nevertheless typically an East African genus. Of the twenty-four known species only two (*H. inclusa* (Karsch) and *H. crosskeyi* sp. n.) occur west of the 10° E. line of longitude. The majority of the species are confined to British East Africa and Rhodesia, and many of these to quite small areas within these regions. Five species (*H. somali* (Schulthess), *H. magna* sp. n., *H. ruspolii* (Schulthess), *H. diminuta* (Chopard), and *H. vicina* (Chopard)) occur only in the semi-desert area of eastern Africa, north of the equator, and a further species, *H. heteromorpha* (Karsch), extends only a little further south. *H. stylifera* (Karny) is apparently confined to South West Africa and Angola, and the widespread species *H. serrifera* Schaum extends southwards into the more northerly part of South West Africa. The tropic of Capricorn probably marks the approximate southern limit of the genus; the Acrometopae occurring south of this tropic all belong to either *Conchotopoda* Karsch or *Prosphega* gen. n.

#### KEY TO THE SPECIES

Due to the fact that the females of many of the species lack features of diagnostic importance this key is based entirely on males. If it is necessary to identify female specimens which are not associated with males, reference should be made to the illustrations of the female fore wings (Text-figs. 81-98) and ovipositors (Text-figs. 99-119). This should narrow the field considerably, and comparison with the measurements and distribution of the species thus suggested may well produce a fairly certain identification. In some of the species, however, a definite identification is impossible in the absence of the male sex.

Species which could agree with either half of any one of the couplets given below are keyed out twice.

- |   |  |
|---|--|
| 1. Tenth abdominal tergite greatly enlarged, as in Text-figs. 45-55 . . . . .                         | 2  |
| -. Tenth abdominal tergite not as in Text-figs. 45-55, unmodified or only slightly enlarged . . . . . | 7  |
| 2. Hind femora less than 21 mm. in length. Genitalia as in Text-fig. 53                               |  |
| <i>H. elgonis</i> (Chopard) (p. 312)  |  |
| -. Hind femora more than 21 mm. in length. Genitalia not as in Text-fig. 53 . . . . .                 | 3  |
| 3. Tenth abdominal tergite as in Text-figs. 45-52. (East African species) . . . . .                   | 4  |
| -. Tenth abdominal tergite as in Text-figs. 54 and 55. (West African species) . . . . .               | 6  |
| 4. Hind wings fully developed . . . . .   | <i>H. ruspolii</i> (Schulthess) (p. 313) |
| -. Hind wings greatly reduced or rudimentary . . . . .  | 5  |

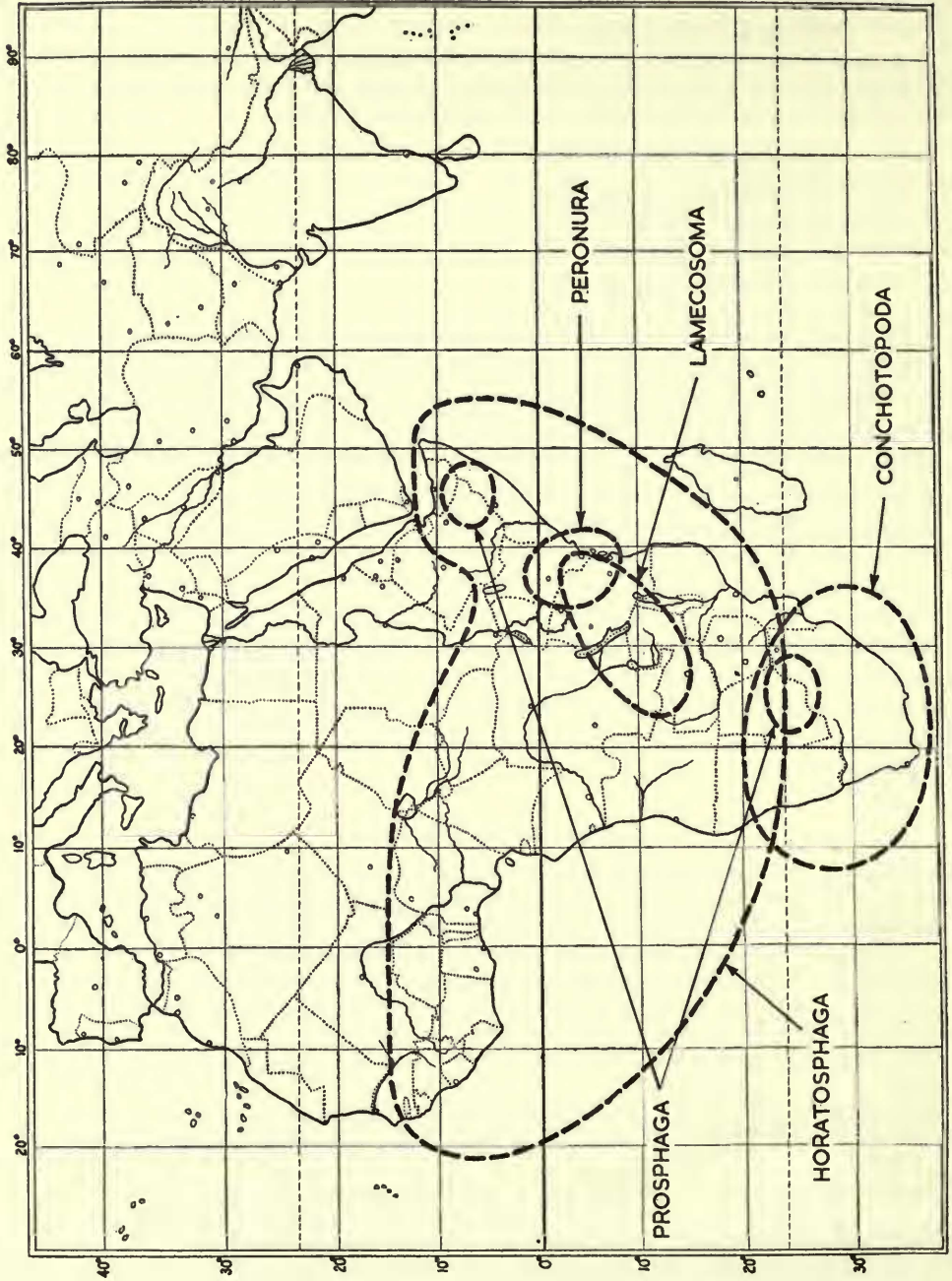
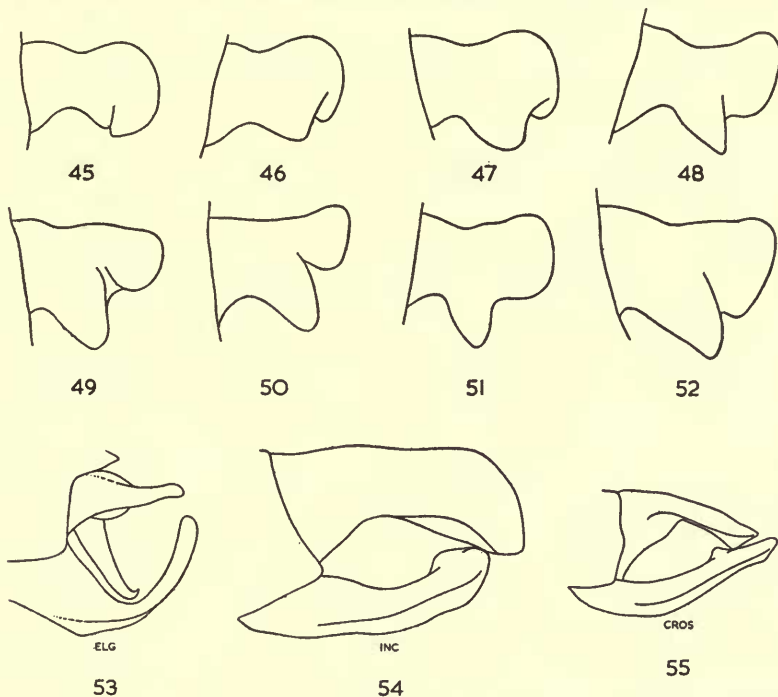


Fig. 44. Map showing the approximate distribution of the five genera of African Acrometopae.



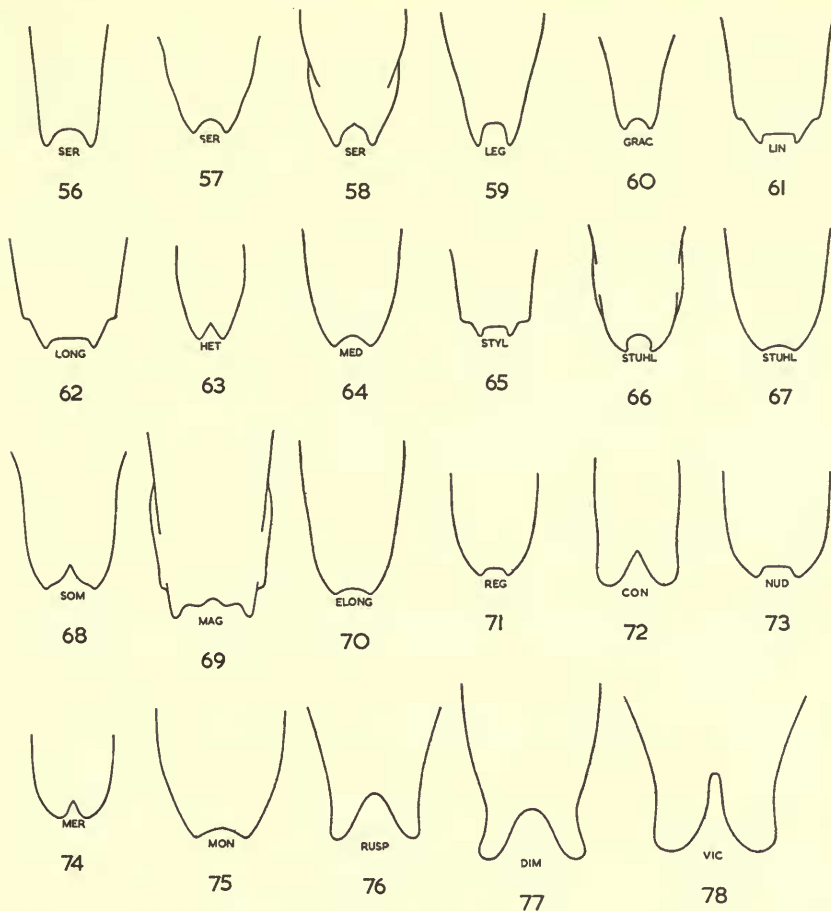
- 5. Median length of the pronotum more than 6.5 mm. . . . . *H. vicina* (Chopard) (p. 316)
- . Median length of the pronotum less than 6.5 mm. . . . . *H. diminuta* (Chopard) (p. 315)
- 6. Genitalia as in Text-fig. 55.  $R_s$  of the fore wings usually bifurcate . . . . . *H. crosskeyi* sp. n. (p. 318)
- . Genitalia as in Text-fig. 54.  $R_s$  of the fore wings unbranched *H. inclusa* (Karsch) (p. 317)
- 7. Hind wings absent or vestigial . . . . . 8
- . Hind wings well developed or at least half the length of the fore wings . . . . . 11



FIGS. 45-55. *Horatosphaga* Schaum. 45-50. Lateral view of the male tenth abdominal tergite of *H. ruspolii* (Schulthess) from (45) Turkana, (46) south of Lake Rudolph, (47) El Carre, (48) Lak Telangor, and (49 and 50) Damassa. 51 and 52. Lateral view of the male tenth abdominal tergite of *H. diminuta* (Chopard) from (51) Moyale, and (52) Marsabit. 53-55. Lateral view of the male genitalia of (53) *H. elgonis* (Chopard); (54) *H. inclusa* (Karsch); (55) *H. crosskeyi* sp. n.

- 8. Fore wings broad, as in Text-figs. 33 and 34, about three times longer than their maximum width . . . . . 9
- . Fore wings narrower, as in Text-figs. 31 and 32, about four times longer than their maximum width . . . . . 10
- 9. Pronotal disc strongly verrucose. Fore wings with black spots . . . . . *H. montivaga* (Sjöstedt) (p. 311)
- . Pronotal disc not verrucose (though rather rugose). Fore wings without black spots . . . . . *H. nomima* (Karsch) (p. 311)
- 10. Fore wings shaped as in Text-fig. 32; R bifurcate in the proximal half of the wing . . . . . *H. meruensis* (Sjöstedt) (p. 310)
- . Fore wings shaped as in Text-fig. 31; R unbranched or bifurcate in the distal half of the wing . . . . . *H. nuda* sp. n. (p. 309)





FIGS. 56-78. Ventral view of the male subgenital plate of (56) *Horatosphaga serrifera* Schaum (Northern Rhodesia); (57) *H. serrifera* Schaum (South West Africa); (58) *H. serrifera* Schaum (Nyasaland); (59) *H. leggei* (Kirby); (60) *H. gracilis* (Sjöstedt); (61) *H. linearis* (Rehn); (62) *H. longipes* (Bolivar); (63) *H. heteromorpha* (Karsch); (64) *H. media* sp. n.; (65) *H. stylifera* (Karny); (66) *H. stuhlmanni* (Karsch) (Mahagi Port); (67) *H. stuhlmanni* (Karsch) (Rutshuru); (68) *H. somali* (Schulthess); (69) *H. magna* sp. n.; (70) *H. elongata* (Rehn); (71) *H. regularis* (Bolivar); (72) *H. concava* sp. n.; (73) *H. nuda* sp. n.; (74) *H. meruensis* (Sjöstedt); (75) *H. montivaga* (Sjöstedt) (*H. nomima* (Karsch) is similar); (76) *H. ruspolii* (Schulthess); (77) *H. diminuta* (Chopard); (78) *H. vicina* (Chopard).



FIGS. 79 and 80. Dorsal view of the male tenth abdominal tergite of (79) *Horatosphaga concava* sp. n.; (80) *H. montivaga* (Sjöstedt) (*H. nomima* (Karsch) is similar).

27. Hind femora more than 30 mm. in length . . . . . *H. serrifera* Schaum (p. 288)  
 —. Hind femora less than 30 mm. in length . . . . . 28
28. Venation of the fore wings as in Text-fig. 24; stridulatory rib of the left fore wing  
 very prominent and more than 3 mm. in length . . . . . *H. stuhlmanni* (Karsch) (p. 301)  
 —. Venation of the fore wings as in Text-figs. 27, 28, or 29; stridulatory rib of the left  
 fore wing not particularly prominent and usually less than 3 mm. in length. . . . . 29
29. Venation of the fore wings as in Text-figs. 27 or 28. (Eastern Belgian Congo)  
 . . . . . *H. elongata* (Rehn) (p. 306)  
 —. Venation of the fore wings as in Text-figs. 29. (Not known from Belgian Congo)  
 . . . . . *H. regularis* (Bolivar) (p. 307)

### 1. *Horatosphaga serrifera* Schaum, 1853

- Horatosphaga serrifera* Schaum, 1853, *Ber. Preuss. Akad. Wiss. Berlin*, 1853: 778. Holotype ♀, MOZAMBIQUE (*Peters*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.
- Pantolepta vosseleri* Karny, 1910, *Denkschr. med.-naturw. Ges. Jena*, 16: 52. Ten ♂ syntypes, SOUTH WEST AFRICA: Okahandja (*Dinter*). One ♂ syntype, SOUTH WEST AFRICA: Kung-Buschmannland (*Lübbert*). All in the Zoologisches Museum of the Humboldt-Universität, Berlin. *Syn. n.*
- Pantolepta multivenosa* Chopard, 1935, *Mem. Mus. zool. Univ. Coimbra* (1) 85: 2. Holotype ♂, MOZAMBIQUE: Nova Chupanga, nr. Chemba, ii.1929 (*Lesne*). In the Muséum National d'Histoire Naturelle, Paris. *Syn. n.*

DIAGNOSIS. ♂. Venation of fore wings as in Text-figs. 11, 12, and 13. Hind femora with dorsal ridge at apex, ending in small spine. Subgenital plate as in Text-figs. 56 and 57.

♀. Venation of fore wings as in Text-fig. 81. Hind femora with dorsal ridge at apex, ending in small spine. Ovipositor as in Text-figs. 99 and 100.

#### MEASUREMENTS

##### *Males*

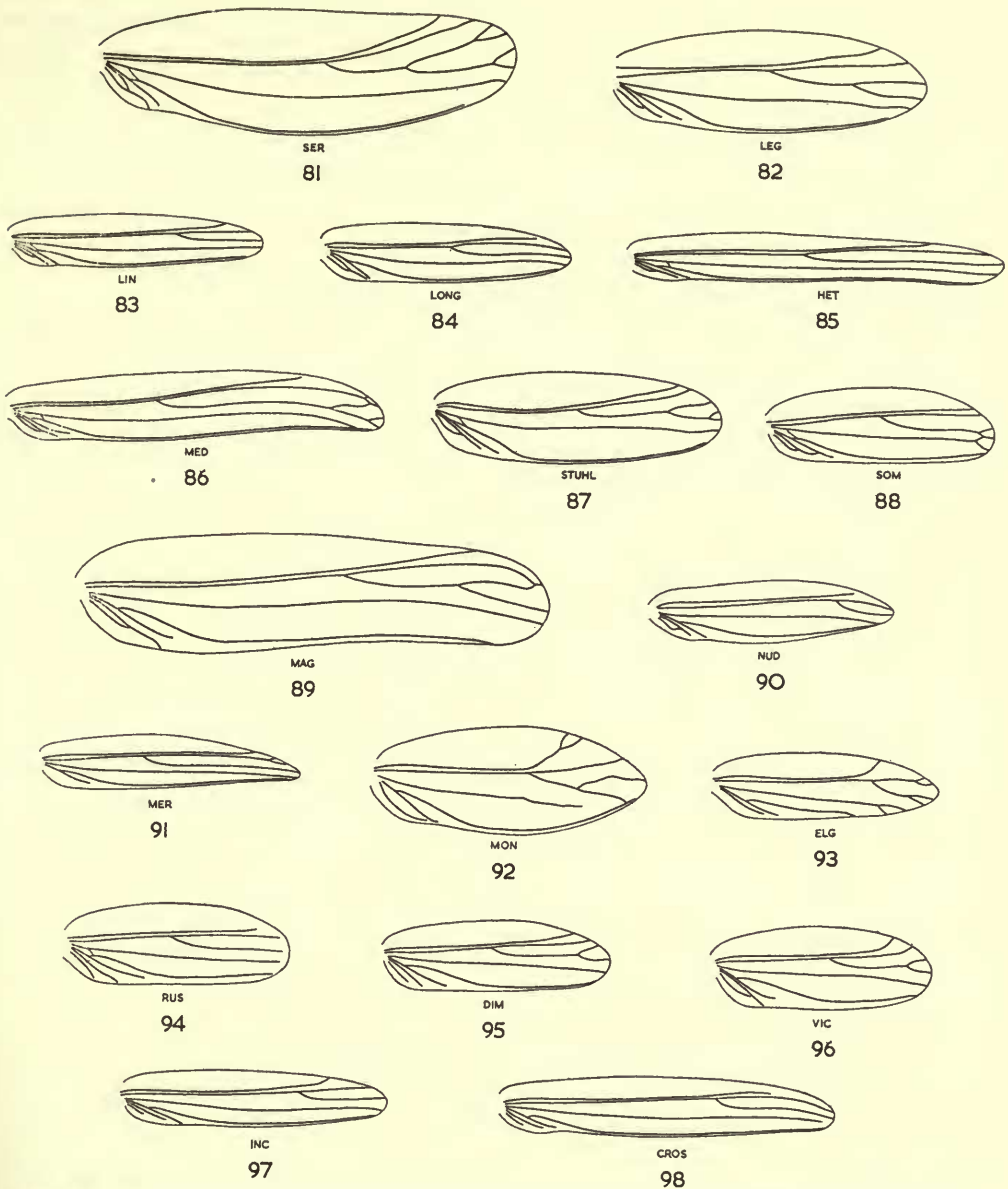
- Total length (20): 44.8–50.9, mean 48.31.  
 Median length of pronotum (20): 5.6–6.9, mean 6.37.  
 Length of hind femur (20): 31.6–37.8, mean 35.44.  
 Length of fore wing (20): 35.8–42.6, mean 39.02.

##### *Females*

- Total length (20): 36.0–45.5, mean 40.54.  
 Median length of pronotum (20): 6.4–7.6, mean 7.05.  
 Length of hind femur (20): 29.7–35.3, mean 33.50.  
 Length of fore wing (20): 28.5–35.3, mean 32.02.  
 Length of ovipositor (20): 9.0–14.7, mean 12.58.

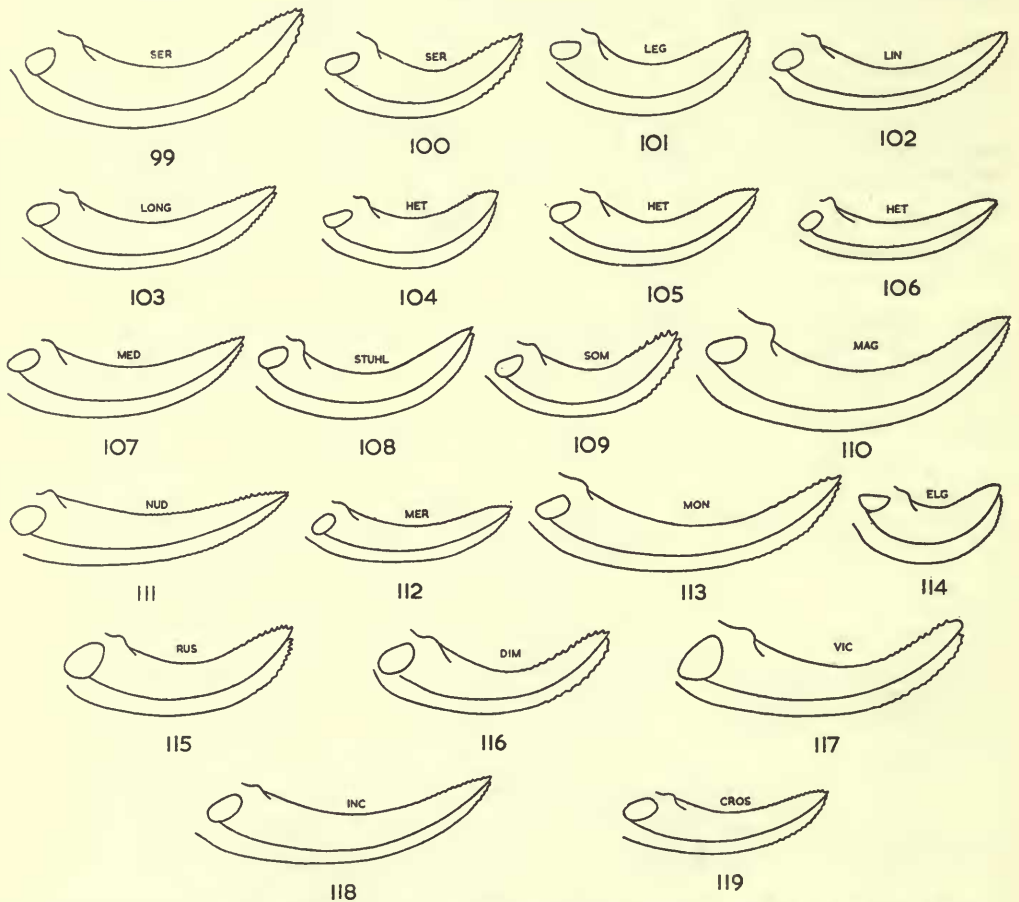
DISCUSSION. This species shares with *H. leggei* (Kirby) and *H. gracilis* (Sjöstedt) the small spine at the tip of the hind femur, though this character is occasionally rather feebly developed in the present species. The males of *H. serrifera* Schaum may be distinguished from these two species by the venation of the fore wings, and the females differ from those of *H. leggei* (Kirby) by their much longer fore wings and larger ovipositor. (The female sex of *H. gracilis* (Sjöstedt) is as yet unknown.)

*H. serrifera* Schaum shows distinct geographical variation, and doubtless it will be



FIGS. 81-98. The right female fore wing of (81) *Horatosphaga serrifera* Schaum; (82) *H. leggei* (Kirby); (83) *H. linearis* (Rehn); (84) *H. longipes* (Bolivar); (85) *H. heteromorpha* (Karsch); (86) *H. media* sp. n.; (87) *H. stuhlmanni* (Karsch); (88) *H. somali* (Schulthess); (89) *H. magna* sp. n.; (90) *H. nuda* sp. n.; (91) *H. meruensis* (Sjöstedt); (92) *H. montivaga* (Sjöstedt); (93) *H. elgonis* (Chopard); (94) *H. ruspolti* (Schulthess); (95) *H. diminuta* (Chopard); (96) *H. vicina* (Chopard); (97) *H. inclusa* (Karsch); (98) *H. crosskeyi* sp. n.

possible to delimit subspecies when more material is available. In males of the typical form, probably occurring over a large part of the low grass savanna and open woodland of Mozambique, Rhodesia, Angola, and south-eastern Belgian Congo, the venation of the fore wings is of the type shown in Text-figs. 11 and 12. In the much drier semi-desert areas of South West Africa and the coastal fringe of southern Angola, however, the venation of the male fore wings takes the form shown in Text-fig. 13, with area R extending further towards the wing-base. Females from this part of Africa have a considerably smaller ovipositor (Text-fig. 100) than those



FIGS. 99-119. Lateral view of the ovipositor of (99) *Horatosphaga serrifera* Schaum (Northern Rhodesia); (100) *H. serrifera* Schaum (South West Africa); (101) *H. leggei* (Kirby); (102) *H. linearis* (Rehn); (103) *H. longipes* (Bolivar); (104) *H. heteromorpha* (Karsch) (Kenya, Mombasa); (105) *H. heteromorpha* (Karsch) (Kenya, Marsabit); (106) *H. heteromorpha* (Karsch) (Ethiopia, Harar); (107) *H. media* sp. n.; (108) *H. stuhlmanni* (Karsch); (109) *H. somali* (Schulthess); (110) *H. magna* sp. n.; (111) *H. nuda* sp. n.; (112) *H. meruensis* (Sjöstedt); (113) *H. montivaga* (Sjöstedt); (114) *H. elgonis* (Chopard); (115) *H. ruspolii* (Schulthess); (116) *H. diminuta* (Chopard); (117) *H. vicina* (Chopard); (118) *H. inclusa* (Karsch); (119) *H. crosskeyi* sp. n.

of the typical form (Text-fig. 99). If further material shows that delimitation of subspecies would be useful, this deserticolous form would take the name *vosseleri* Karny, 1910 (type locality : South West Africa).

Examination of a syntype of *Pantolepta vosseleri* Karny and the holotype of *P. multivenosa* Chopard has convinced me that these specimens are conspecific with the holotype of *H. serrifera* Schaum. The association of males with females in this species has been greatly facilitated by a long series of both sexes collected by Burr in Northern Rhodesia.

#### MATERIAL EXAMINED

♀ holotype. One ♂ syntype (Kung-Buschmannland) of *Pantolepta vosseleri* Karny. ♂ holotype of *P. multivenosa* Chopard.

KENYA : Rabai, iv-vi.1928 (*van Someren*) (4♂, 1♀) ; BELGIAN CONGO : Albertville, i.1919 (Mayné) (2♂) (Mus. Congo Belge) ; NYASALAND : Zomba, 1947 (*Lennon*) (1♂) ; —, 31.iii.1913 (*Neave*) (1♀) ; NORTHERN RHODESIA : Luano Valley, Chisorwe, i-iv.1928 (*Burr*) (61♂, 29♀) ; SOUTHERN RHODESIA : Queque (—) (1♂) (S. A. Mus.) ; ANGOLA : Quirimbo, v.1934 (*Jordan*) (1♂) ; Amboim, 22.iv.1927 (*Burr*) (1♂) ; — (1♂) ; SOUTH WEST AFRICA : Okahandja, ii-iii.1928 (*Turner*) (1♂, 1♀).

In the British Museum (Natural History) unless otherwise stated.

DISTRIBUTION. This species is distributed throughout tropical Africa south of the equator.

#### 2. *Horatosphaga leggei* (Kirby, 1909) comb. n.

*Thaumatoxenia leggei* Kirby, 1909, *Trans. zool. Soc. Lond.* 19 : 65. Lectotype ♂, UGANDA : E. Ruwenzori, Mubuku Valley, 6,000 ft., xii.1905 (*Legge & Wollaston*). One ♂ syntype, UGANDA : E. Ruwenzori, Mubuku Valley, 6,000 ft., 13.i.1906 (*Legge & Wollaston*). Both in the British Museum (Natural History).

*Horatosphaga robusta* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5 : 156. Holotype ♀, BELGIAN CONGO : 90 km. west of Albert-Nyanza, 1,600 m., forest (*Grauer*). In the Zoologisches Museum of the Humboldt-Universität, Berlin. *Syn. n.*

*Conchotopoda amplipennis* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5 : 165. Holotype ♂, BELGIAN CONGO : Lake Kivu, Idjwi I., ix.1907 (*Schubotz*). In the Zoologisches Museum of the Humboldt-Universität, Berlin. *Syn. n.*

*Peronura affinis* Bolivar, 1922, *Voy. M. Rothschild E. Afr. Anim. Art.* 1 : 198. Holotype ♀, KENYA : Escarpment, viii-ix.1904 (*Rothschild*). In the Muséum National d'Histoire Naturelle, Paris. *Syn. n.*

DIAGNOSIS. ♂. Venation of fore wings as in Text-figs. 14 and 15 ; cross-veins of area MA strongly curved outwards. Hind femora with dorsal ridge at apex, ending in small spine. Subgenital plate as in Text-fig. 59.

♀. Venation of fore wings as in Text-fig. 82. Hind femora with dorsal ridge at apex, ending in small spine. Ovipositor as in Text-fig. 101. Pronotum with well-developed lateral carinae in metazona.

#### MEASUREMENTS

##### Males

Total length (20) : 37.5-49.2, mean 44.45.

Median length of pronotum (20) : 4.7-6.2, mean 5.41.

Length of hind femur (20) : 23.5-30.3, mean 27.80.

Length of fore wing (20) : 29.6-40.2, mean 35.50.

## MEASUREMENTS—(cont.)

*Females*

- Total length (20) : 28.3–34.2, mean 31.43.  
 Median length of pronotum (20) : 4.8–5.9, mean 5.41.  
 Length of hind femur (20) : 20.5–27.1, mean 23.92.  
 Length of fore wing (20) : 22.8–28.0, mean 24.72.  
 Length of ovipositor (20) : 7.3–9.5, mean 8.54.

DISCUSSION. This is the most common species of *Horatosphaga* Schaum in the highlands of British East Africa and eastern Belgian Congo. The males may be easily recognized by the broad fore wings with the strongly arcuate cross-veins in the anterior medial area. The short ovipositor with very small serrations and the relatively broad fore wings serve to distinguish the females from the other East African species of the genus.

I have selected and marked one of the syntypes of *H. leggei* (Kirby) as a lectotype ; this specimen was marked as " type " by Kirby, but his selection of it as type was not published. The holotypes of *H. robusta* Rehn, *Conchotopoda amplipennis* Rehn, and *Peronura affinis* Bolivar, were examined and found to be conspecific with the lectotype of *H. leggei* (Kirby).

## MATERIAL EXAMINED

♂ lectotype and ♂ syntype. ♀ holotype of *H. robusta* Rehn. ♂ holotype of *Conchotopoda amplipennis* Rehn. ♀ holotype of *Peronura affinis* Bolivar.

UGANDA: Ruwenzori Range, Kilembe, 4,500 ft., xii. 1934–i. 1935 (*Edwards*) (2♂, 1♀); Namanve, 17. ix. 1933 (*Johnston*) (2♂); Bugoma Forest, Bunyora, 5. vi. 1935 (*Johnston*) (1♂); Bugoma Forest, vi. 1933 (*Johnston*) (2♂, 2♀); Mabira Forest, vi. 1934 (*Johnston*) (4♂); Mabira Forest, vi–ix. 1913 (*Gowdey*) (2♂, 2♀); Mabira area, v. 1938 (*Taylor*) (3♀); Mubende, 18. x. 1933 (*Johnston*) (1♀); Kigezi, x. 1934 (*Buxton*) (1♂, 1♀); Kigezi, Kasheshi, 7,000 ft., hill scrub, xi. 1935 (*Johnston*) (1♀); Sczibwa Falls, 16. iv. 1933 (*Johnston*) (1♂); Kawanda, 3. ii. 1940 (*Hargreaves*) (1♂); Entebbe, viii. 1912 (*Wiggins*) (1♂); Kampala, 18. i. 1935 (*Hargreaves*) (1♀); Kampala, 20. vii. 1934 (*Hargreaves*) (1♀); Masaka, Kalisizo, 18. v. 1935 (*Johnston*) (1♀); Tero Forest, vii. 1912 (*Gowdey*) (1♂, 3♀); KENYA: Nairobi, 6,000 ft. (*Andrews*) (1♂); Kaimosi, iii–iv. 1932 (—) (1♀); Songhor, ix. 1917 (*Dry*) (1♀); TANGANYIKA: Tshibinda, 21–27. viii. 1931 (*Mackie*) (2♂, 9♀); Rukwa Valley, 23. ii. 1957 (*Whellan*) (1♂); Old Shinyanga, at light, iv–vi. 1953 (*Burt*) (8♂); Bukoba, ix. 1921 (*Miller*) (2♀); BELGIAN CONGO: Djugu, Ituri Forest, open edge of forest, cleared ground, 5. x. 1935 (*Johnston*) (1♂); Mt. Ruwenzori, Kalonge, 7,200 ft., 6. vii. 1935 (*Brédo*) (1♂); Ruwenzori, Kalonge, vii. 1937, (*Brédo*) (1♂, 1♀) (Mus. Congo Belge); Ruwenzori, Kalonge, 2,050 m., viii. 1932 (*Burgeon*) (2♂, 1♀) (Mus. Congo Belge); Kalonge, Riv. Mushuva, 15. xii. 1949 (*Marlier*) (1♂, 1♀) (Mus. Congo Belge); Lac Kivu, Rwankwi, iv–v. 1948 (*Leroy*) (2♂) (Mus. Congo Belge); Kivu, Costermansville,



1951 (*Bomans*) (1 ♂, 1 ♀) (Mus. Congo Belge); W. Kivu, Kashusha, 1937 (*Vandelannoite*) (17 ♂, 4 ♀) (Mus. Congo Belge); Kivu, Kabwe, 23.xi.1932 (*Burgeon*) (1 ♂) (Mus. Congo Belge); Kivu, Tshibinda, xi.1927 (*Seydel*) (1 ♂) (Mus. Congo Belge); Kivu, Kapanga, 1952 (*Froidebise*) (1 ♂) (Mus. Congo Belge); Kivu, Lulenga, 24.ix.1932 (*Burgeon*) (2 ♂) (Mus. Congo Belge); Kivu, Kamisimbi, 21.vi.1938 (*Hendrickx*) (1 ♂) (Mus. Congo Belge); Kivu, Tshibinda, 2.xii.1932 (*Burgeon*) (1 ♂) (Mus. Congo Belge); Kivu, Terr. Kabare, Katana, xii.1954 (—) (1 ♀) (Mus. Congo Belge); Kivu, Terr. Kabare, Lwiro, x.1953 (—) (1 ♂, 2 ♀) (Mus. Congo Belge); Kivu, Lubero, 10.xii.1935 (*Brédo*) (2 ♂, 4 ♀) (Mus. Congo Belge); Kivu, Kirrenyi, 1924 (*Saceghem*) (1 ♀) (Mus. Congo Belge); Kivu, Kahuzi, 15.v.1938 (*Hendrickx*) (1 ♀) (Mus. Congo Belge); Kivu, Mt. Kahuzi, ix.1951–ii.1952 (*Bomans*) (1 ♂, 1 ♀) (Mus. Congo Belge); NE. Kivu, La Matura, iii.1928 (*Seydel*) (1 ♀) (Mus. Congo Belge); Kivu, Buseregenye, 1930 (*Luja*) (1 ♀) (Mus. Congo Belge); Kivu, Goma, 10.ii.1937 (*Brédo*) (2 ♀) (Mus. Congo Belge); Kivu, Niamlagira, 2,700 m., 29.ix.1932 (*Burgeon*) (2 ♀) (Mus. Congo Belge); Kivu, Bwito, 1,700 m., ix.1934 (*Marlier*) (1 ♀) (Mus. Congo Belge); Kivu, Lwiro-Katana, i–ii.1954 (—) (1 ♀) (Mus. Congo Belge); Kivu, Mulungu, 1939 (*Hendrickx*) (2 ♀) (Mus. Congo Belge); Kivu, Lubero, Mulo, 1,960 m., vi–vii.1953 (*Célis*) (1 ♀) (Mus. Congo Belge); Kivu, Kapanga, 1952 (*Froidebise*) (1 ♀) (Mus. Congo Belge); Kivu, Loashi, 1,350 m., 28–30.ix.1949 (*Laurent*) (4 ♀) (Mus. Congo Belge); Kivu, Masisi, 1938 (*Le Moulé*) (3 ♂, 3 ♀) (Zool. Inst. Lund); Kibali-Ituri, Geti, 1934 (*Scops*) (1 ♂) (Mus. Congo Belge); Kibali-Ituri, Kilo, 18.x.1930 (*Soleil*) (1 ♀) (Mus. Congo Belge); Ituri, Kilo, 1930 (*Soleil*) (1 ♀) (Mus. Congo Belge); Ituri, Lubero, 1928 (*van Riel*) (1 ♂) (Mus. Congo Belge); Ituri, Lubero, 1,900 m., 1928 (*van Riel*) (1 ♂) (Mus. Congo Belge); Ituri, Bulembo, xii.1928 (*van Riel*) (1 ♂) (Mus. Congo Belge); Buta, 1937 (*Hutsebaut*) (2 ♂, 1 ♀) (Mus. Congo Belge); Volcan Sabinjo, Bunagana, 1935 (*Brédo*) (9 ♂, 5 ♀) (Mus. Congo Belge); Volcan Nyamlagira, 5.i.1936 (*Brédo*) (2 ♂) (Mus. Congo Belge); Rutshuru, v.1938 (*Ghesquière*) (1 ♂, 1 ♀) (Mus. Congo Belge); Rutshuru, 15.v.1936 (*Lippens*) (1 ♀) (Mus. Congo Belge); Mongbwalu, 1937 (*Harford-Jordens*) (2 ♂) (Mus. Congo Belge); Kamogobe, 8.iii.1936 (*Lippens*) (1 ♂) (Mus. Congo Belge); Lake Tanganyika, Nyanza, 28.xii.1932 (*Burgeon*) (1 ♂) (Mus. Congo Belge); Kilo, i.1940 (*Maristes*) (1 ♂) (Mus. Congo Belge); Ruanda, Rutovu, Forêt du Rugege, 2,350 m., 20–23.i.1953 (*Basilewsky*) (3 ♂, 1 ♀) (Mus. Congo Belge); Beni (*Borgerhoff*) (2 ♀) (Mus. Congo Belge); Mombassa, viii.1932 (*Burgeon*) (1 ♀) (Mus. Congo Belge); Masisi-Walikale (*Bonnevie*) (3 ♀) (Mus. Congo Belge); Lesse (*Bonnevie*) (2 ♀) (Mus. Congo Belge); Region des Lacs (*Sagona*) (3 ♀) (Mus. Congo Belge); Dungu, 1912 (*Hutereau*) (1 ♀) (Mus. Congo Belge); Urundi, Kanyinya, 1,500 m., xii.1947–i.1948 (*Dames de Marie*) (1 ♀) (Mus. Congo Belge); Urundi, Muyeha, 1,700 m., 13.vii.1952 (*Laurent*) (2 ♀) (Mus. Congo Belge); Nyongwe, Forêt Rugege, 2,000 m., viii.1949 (*Laurent*) (1 ♀) (Mus. Congo Belge).

In the British Museum (Natural History) unless otherwise stated.

DISTRIBUTION. *H. leggei* (Kirby) ranges over all the higher parts of British East Africa and eastern Belgian Congo. It is not yet known from south of the Rukwa Valley or from anywhere below 1,500 ft.

3. *Horatosphaga gracilis* (Sjöstedt, 1912) comb. n.

*Keniicola gracilis* Sjöstedt, 1912, *Ark. Zool.* 7 (38) : 14. Holotype ♂, KENYA : Mt. Kenya, Urwald, 21.iii.1911 (Lönnerberg). In the Naturhistoriska Riksmuseum, Stockholm.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 16. Hind femora with dorsal ridge at apex, ending in small spine. Subgenital plate as in Text-fig. 60.  
♀ unknown.

## MEASUREMENTS

*Males*

Total length (3) : 32.3–33.4, mean 32.87.

Median length of pronotum (4) : 4.4–5.0, mean 4.70.

Length of hind femur (3) : 18.5–21.0, mean 19.83.

Length of fore wing (4) : 24.2–26.4, mean 25.40.

DISCUSSION. This species may be distinguished from *H. leggei* (Kirby) and *H. serrifera* Schaum, which also have the small spine at the tip of the hind femur, by its much smaller size and the venation of the male fore wings.

## MATERIAL EXAMINED

♂ holotype.

KENYA : Mt. Kenya, viii–x.1927 (*Insoll*) (2 ♂) (British Museum (Natural History)); Kiambu, 1936 (*Anderson*) (1 ♂) (*Zool. Inst. Lund*).

DISTRIBUTION. This species is so far known only from a small area of the highlands of central Kenya. It is probably confined to high ground and quite possibly shows a preference for the temperate forest vegetation associated with the localities mentioned above.

4. *Horatosphaga linearis* (Rehn, 1914) comb. n.

*Conchotopoda linearis* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5 : 167. Holotype ♂, UGANDA : Mpororo, 1.vii.1907 (*Schubotz*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

?*Pachypyga karschi* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5 : 161. Holotype ♀, BELGIAN CONGO : Ruanda, Lake Mohasi, 29.vii.1907 (*Schubotz*). In the Zoologisches Museum of the Humboldt-Universität, Berlin. (See below.)

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 17;  $R_s$  unbranched. Hind femora with feebly developed dorsal ridge at apex, usually ending in small point. Subgenital plate as in Text-fig. 61.

♀. Venation of fore wings as in Text-fig. 83. Hind femora with feebly developed dorsal ridge at apex, usually ending in small point. Ovipositor as in Text-fig. 102. Fore wings often with dark spots along basal half of anterior margin.

## MEASUREMENTS

*Males*

Total length (11) : 33.1–37.8, mean 35.58.

Median length of pronotum (9) : 3.5–4.6, mean 4.23.

Length of hind femur (9) : 24.6–27.8, mean 26.33.

Length of fore wing (11) : 24.1–27.3, mean 25.84.

*Females*

Total length (5) : 26.7-29.5, mean 27.90.

Median length of pronotum (6) : 4.6-5.4, mean 5.01.

Length of hind femur (5) : 21.8-24.2, mean 23.30.

Length of fore wing (6) : 20.5-24.0, mean 21.95.

Length of ovipositor (6) : 10.1-11.3, mean 10.68.

DISCUSSION. The venation of the fore wings and the shape of the subgenital plate are characteristic of the male of this species. The female sex may be distinguished from *H. stuhlmanni* (Karsch) by the fore wings and the ovipositor, which are both more slender, but does not seem to differ from *H. longipes* (Bolivar) by any constant character.

The holotype of *Pachyphyga karschi* Rehn appears to differ from females of *H. linearis* (Rehn) by only the narrower fore wings. The high variability of the species suggests the possibility that this specimen is also a female of *H. linearis* (Rehn), but the material available at present is inadequate to establish a definite synonymy.

## MATERIAL EXAMINED

♂ holotype. ♀ holotype of *Pachyphyga karschi* Rehn.

BELGIAN CONGO : Ruanda, Kagera, Gahinga, 26-30.iv.1937 (*Brédo*) (5 ♂, 2 ♀) (Mus. Congo Belge) ; Kivu, Goma, 10.ii.1937 (*Brédo*) (1 ♀) (Mus. Congo Belge) ; UGANDA : Ankole, Lwasamaire, upland grassland, 22.xi.1935 (*Johnston*) (2 ♂, 1 ♀) ; Bulemezi, Luwero, rough tuft grass, 7.xi.1935 (*Johnston*) (1 ♂) ; Ankole, Lutobo, rough ground, xi.1935 (*Johnston*) (1 ♂) ; Ankole, Bukinda, rough ground, 27.xi.1935 (*Johnston*) (1 ♀) ; Mbarara, i.1934 (*Johnston*) (1 ♀) ; TANGANYIKA : Old Shinyanga, Boma, 4.iv.1935 (*Burt*) (1 ♂).

In the British Museum (Natural History) unless otherwise stated.

DISTRIBUTION. The data listed above suggest that this species is most abundant in the mountainous area to the east of Lake Kivu, though also occurring in southern Uganda and northern Tanganyika.

5. *Horatosphaga longipes* (Bolivar, 1922) comb. n.

*Peromura longipes* Bolivar, 1922, *Voy. M. Rothschild E. Afr. Anim. Art.* 1 : 197. Holotype ♀, KENYA : Naivasha, 1906 (*Rothschild*). In the Muséum National d'Histoire Naturelle, Paris.

DIAGNOSIS. ♂. Hind wings not extending beyond fore wings, when at rest, though at least half their length. Venation of fore wings as in Text-fig. 18. Subgenital plate as in Text-fig. 62.

♀. Venation of fore wings as in Text-fig. 84. Ovipositor as in Text-fig. 103. Fore wings often with dark spots along basal half of anterior margin.

## MEASUREMENTS

*Males*

Total length (1) : 29.5.

Median length of pronotum (2) : 5.5-5.6, mean 5.55.

Length of hind femur (2) : 23.5-25.7, mean 24.6.

Length of fore wing (2) : 22.6-25.3, mean 23.95.

## MEASUREMENTS—(cont.)

*Females*

Total length (7) : 24.6–28.9, mean 27.56.

Median length of pronotum (7) : 5.1–5.7, mean 5.55.

Length of hind femur (7) : 19.1–23.6, mean 21.71.

Length of fore wing (7) : 17.8–22.4, mean 21.01.

Length of ovipositor (7) : 9.7–11.6, mean 10.76.

DISCUSSION. Males of this species may be distinguished from the brachypterous form of *H. elongata* (Rehn) (of which females are so far unknown), which has hind wings of a similar size, by the subgenital plate, the venation of the fore wings, and the inflated tympanic auricles. The shape of the male subgenital plate is a character shared only by *H. linearis* (Rehn) (apart from the much more southerly species *H. stylifera* (Karny)), and it is possible that these two species represent parallel montane developments from a more widespread common stock.

## MATERIAL EXAMINED

♀ holotype.

KENYA : Lake Elmenteita, 14.vii.1950 (*Uvarov*) (1 ♂, 2 ♀) ; Eb Urura, iv–v. 1900 (*Betton*) (1 ♂, 2 ♀) ; Gelegele R., vi.1913 (*Luckman*) (1 ♀) ; Aberdare Mts., Ngobit, 7,000 ft., xi.1945 (*Buxton*) (1 ♀).

All in the British Museum (Natural History).

DISTRIBUTION. This species is probably confined to the Kenya Highlands.

6. *Horatosphaga heteromorpha* (Karsch, 1888) comb. n.

*Pantolepta heteromorpha* Karsch, 1888, *Berl. ent. Z.* **32** : 430. One ♂ lectotype and one ♀ syntype, KENYA : Mombasa, xii.1876 (*Hildebrandt*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

*Plegmatoptera hoehneli* Brunner, 1891, *Additamenta zur Monographie der Phaneropteriden*, p. 44. Holotype ♀, TANGANYIKA : Kilimanjaro (*Hoehnel*). In the Naturhistorisches Museum, Vienna. *Syn. n.*

*Euthyphlebia parallela* Schulthess, 1898, *Ann. Mus. Stor. nat. Genova*, **39** : 205. Holotype ♂, ETHIOPIA : Dolo, v.1893 (*Ruspoli*). In the Museo Civico di Storia Naturale, Genoa. *Syn. n.*

*Pantolepta kilimandjarica* Sjöstedt, 1909, *Wiss. Ergebn. Schwed. Zool. Expedn. Kilimandjaro, Meru*, 1905–06, **17** : 132. Lectotype ♂, TANGANYIKA : Mt. Meru, Ngare na nyuki, i.1906 (*Sjöstedt*). Probably over thirty syntypes of both sexes, some from TANGANYIKA : Mt. Meru, Ngare na nyuki, ix.1905–i.1906, others from TANGANYIKA : Kilimanjaro, Kibonoto, 1,800 m., xi.1905–iv.1906. Lectotype and most of syntypes in the Naturhistoriska Riksmuseum, Stockholm ; one ♂ syntype (TANGANYIKA : Mt. Meru, Ngare na nyuki, xi.1905 (*Sjöstedt*)) in the British Museum (Natural History). *Syn. n.*

*Plegmatoptera gracilis* Bolivar, 1922, *Voy. M. Rothschild E. Afr. Anim. Art.* **1** : 198. Holotype ♀, KENYA : Loroghi Mtns., 1905 (*Rothschild*). In the Muséum National d'Histoire Naturelle, Paris. *Syn. n.*

DIAGNOSIS. ♂. Venation of fore wings as in Text-figs. 19 and 20. Hind femora often with dorsal ridge at apex, sometimes ending in small spine. Subgenital plate as in Text-fig. 63.

♀. Fore wings, when flexed, usually extending well beyond hind knees ; venation as in Text-fig. 85. Hind femora often with dorsal ridge at apex, sometimes ending in small spine. Ovipositor as in Text-figs. 104, 105, and 106.

## MEASUREMENTS

### *Males*

Total length (20) : 31.5-43.3, mean 38.32.  
 Median length of pronotum (19) : 4.1-5.0, mean 4.51.  
 Length of hind femur (20) : 23.3-29.5, mean 26.36.  
 Length of fore wing (20) : 23.3-32.1, mean 28.64.

### *Females*

Total length (15) : 35.1-43.6, mean 38.47.  
 Median length of pronotum (18) : 4.6-6.1, mean 5.20.  
 Length of hind femur (14) : 22.6-30.1, mean 25.21.  
 Length of fore wing (15) : 29.2-35.8, mean 31.87.  
 Length of ovipositor (19) : 7.4-10.1, mean 8.64.

DISCUSSION. Males of this species may be easily recognized by the venation of the fore wings, especially the manner in which  $R_s$  and MA run closely parallel for an appreciable distance before MA bends rather suddenly towards the hind margin. The females are characterized by the long fore wings, which usually extend well beyond the hind knees.

This species shows remarkable individual and geographical variation, and it is difficult with the material available at present to distinguish between these two components of its variability. The degree of attenuation is very variable ; this is shown best by the shape of the fore wings and their venation, and, in the female, by the shape of the pronotum and ovipositor. The most attenuate forms come from the northernmost part of the range, in Ethiopia and British Somaliland. Here,  $R_s$  is typically unbranched in the male fore wings (Text-fig. 19) and those of the female are extremely long and narrow ; in the latter sex the pronotum is relatively attenuate and the ovipositor (Text-fig. 106) longer and more slender than in more southerly specimens. The opposite extreme is shown by material from the vicinity of Mombasa :  $R_s$  is often branched in the male fore wings (Text-fig. 20), and in the female the pronotum, fore wings, and ovipositor (Text-fig. 104), are much less attenuate. The difference between the extreme forms of ovipositor (cf. Text-figs. 104 and 106) is extraordinary and in other Phaneropterinae would suggest a generic distinction. Material from other parts of the range is generally intermediate between these two forms. Geographical variation is also shown by the terminal spine of the hind femur, which is well developed in the Mombasa specimens, poorly developed in material from most areas, and quite absent in specimens from the northernmost localities. Two female specimens collected at 7,000-8,000 ft. on

Mt. Meru had relatively shorter fore wings than the remaining females, which were all from lower altitudes.

Though sometimes obscured (and sometimes enhanced) by individual variation, the geographical effect is nevertheless a real one, and when more material is available it will doubtless be possible to delimit subspecies. The cause of the variation is almost certainly climatic, the more attenuate specimens coming from the most dry part of the range and the opposite extreme from the wettest.

In view of the foregoing remarks, it is easy to understand why this species should have been named five times. Ruwenzori provides the type locality for two of these names, and the remaining three are widely spread over the remainder of the range, including the localities of the two extreme forms mentioned above. The holotypes were examined in every instance except *Euthyphlebia parallela* Schulthess; in the latter case Dr. Capra of the Museo Civico di Storia Naturale, Genoa, very kindly supplied a description of the relevant characters and a photograph of the fore wing. There can be no doubt that all five names refer to the same species.

I have selected and marked a male lectotype of this species. I have also selected and marked a lectotype from among the syntypes of *Pantolepta kilimandjarica* Sjöstedt; this specimen already carried a red type label.

#### MATERIAL EXAMINED

♂ lectotype. ♀ holotype of *Plegmatoptera hoehneli* Brunner. ♂ lectotype and two female syntypes of *Pantolepta kilimandjarica* Sjöstedt. ♂ holotype of *Plegmatoptera gracilis* Bolivar.

ETHIOPIA: Harar, 12.vi.1955 (*Uvarov*) (1 ♂, 1 ♀); Wambar Mariam, Mt. Zuquála, c. 7,000 ft., dry grass, 28.x.1926 (*Scott*) (1 ♂); Geldi, 30.viii.1949 (*Bellehu*) (1 ♂); nr. Valencheti, at light, 11.v.1948 (*Guichard*) (1 ♂); BRITISH SOMALILAND: Burao distr., El Humah, 18.x.1935 (*Peck*) (1 ♂, 1 ♀); Hargeisa, 4,100 ft., dry season, x.1932 (*Taylor*) (1 ♂); SOMALIA: Mogadiscio, 5.vi.1955 (*Uvarov*) (1 ♂); KENYA: Makindu, 1.III.1954 (*Waloff*) (1 ♂); Marsabit, vi.1934 (L. R. R. V. E.) (3 ♂, 3 ♀); Mombasa, Shimba Hills, iv.1955 (—) (1 ♂) (National Museum of Southern Rhodesia); Mombasa I., Kilindini, v-vi.1955 (Brown) (1 ♂, 1 ♀); Mandera distr., Damassa, 03° 04' N., 41° 20' E., desert grass and thorn-bush, 17.xii.1944 (*Kevan*) (5 ♂, 1 ♀); Moyale distr., Yasere, 03° 30' N., 38° 35' E., thorn-bush, 14.vi.1946 (*Kevan*) (1 ♂, 1 ♀); Moyale, N.F.D., cultivation, 8-10.vi.1947 (*Kevan*) (1 ♂, 1 ♀); Marsabit, N.F.D., upland grassland, 26.II.1944 (*Kevan*) (1 ♀); Marsabit, Chopa Gof, 02° 25' N., 38° 03' E., scrubby bushes, 13.vi.1946 (*Kevan*) (1 ♀); Samburu distr., vi.1944 (*Opiko*) (1 ♀); Mtito Andei, nr. Lushoto, 10.II.1955 (*Haskell*) (1 ♂); TANGANYIKA: Kilimanjaro, 1916 (*West*) (1 ♂, 1 ♀) (S. A. Mus.); Kilimanjaro, 3,000-5,000 ft., x.1884 (*Johnston*) (2 ♂, 2 ♀); Mt. Meru, 7,000-8,000 ft., i.1938 (*Cooper*) (1 ♂, 2 ♀); Morogoro, 1931-32 (*Thompson*) (3 ♂); Songea, Litembo, 1,500 m., 20.IX.1952 (*Lindemann & Pavlitzki*) (1 ♂) (Zoologisches Staatssammlung, Munich).

In the British Museum (Natural History) unless otherwise stated.

DISTRIBUTION. This species occurs over most of the acacia semi-desert area of eastern Africa. It occurs on Kilimanjaro and has been found at a height of 7,000 ft. on Mt. Meru.

7. *Horatosphaga media* sp. n.

Holotype ♂, NORTHERN RHODESIA : Lusaka, x-xii. 1956 (*King*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 21,  $R_s$  usually bifurcating nearer base than tip of wing. Subgenital plate as in Text-fig. 64.

♀. Venation of fore wings as in Text-fig. 86. Ovipositor as in Text-fig. 107.

DESCRIPTION. ♂. Fastigium of vertex sloping to frons, sulcate above.

Pronotum without lateral carinae. Fore femora with about 6-12 external spinules. Tympanic auricles of fore tibiae more or less strongly inflated. Mid femora with about 13-17 external spinules. Fore and mid femora usually with dorsal ridge at apex, often ending in small point. Hind femora with variable number of minute ventral spinules; terminal dorsal spine rarely present. Hind tibiae with about 25-45 external dorsal spines. Venation of fore wings as in Text-fig. 21  $R_s$  usually bifurcating nearer base than tip of wing.

Tenth abdominal tergite very slightly enlarged. Supra-anal plate rounded, flap-like. Cerci moderately robust, apex sharply incurved and pointed. Subgenital plate as in Text-fig. 64.

General coloration green. Top of head, antennae, disc of pronotum, stridulatory organ, hind edge of fore wings, and top of abdomen, usually reddish brown. Legs often partly reddish brown, especially above.

♀. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae or showing tendency towards their formation, especially in posterior half. Armature of legs as in male, except that terminal dorsal spine of hind femora is more often present. Tympanic auricles of fore tibiae not inflated; tympanic apertures slit-like. Venation of fore wings as in Text-fig. 86.

Ovipositor as in Text-fig. 107; margins crenulate in distal half.

General coloration green. Anterior margin of fore wings whitish with reddish submarginal band; posterior margin sometimes reddish. Abdomen often with series of dark red spots on each side.

## MEASUREMENTS

*Males*

Total length (20) : 40.0-47.8, mean 43.95.

Median length of pronotum (20) : 4.7-5.9, mean 5.14.

Length of hind femur (20) : 23.7-32.3, mean 28.53.

Length of fore wing (20) : 30.0-37.8, mean 33.76.

*Females*

Total length (20) : 33.9-42.4, mean 37.77.

Median length of pronotum (20) : 5.4-6.9, mean 5.84.

Length of hind femur (17) : 24.4-30.4, mean 27.59.

Length of fore wing (20) : 26.3-34.7, mean 30.88.

Length of ovipositor (20) : 9.4-13.1, mean 11.10.

VARIATION. There is much variation in the armature of the legs. The degree of inflation of the tympanic auricles of the male fore tibiae is variable. The point at which  $R_s$  bifurcates in the fore wing varies a little in the male, and considerably in the female. There is much variation in the length of the ovipositor.

DISCUSSION. The venation of the fore wings and the genitalia serve to distinguish both sexes of *H. media* sp. n. (Text-fig. 1) from the other members of the genus.

In view of the fact that many of the species of *Horatosphaga* Schaum have been described several times under different names, it seems strange that the present species, apparently quite common throughout Rhodesia, southern Belgian Congo, and south-west Tanganyika, should have remained undescribed; possibly the reason lies in the fact that very little of its range has ever been German territory, and that the principal past workers on the group have been German.

*H. media* sp. n. shows a certain amount of geographical variation. The most striking instance of this is the inflation of the tympanic auricles of the males, which is much more marked in the northern part of the range than in the southern part. When more material is available it may be possible to delimit subspecies.

#### MATERIAL EXAMINED

♂ holotype; 1 ♂ paratype, same data as holotype; 4 ♂ and 1 ♀ paratypes, SOUTHERN RHODESIA: 5-6 miles east of Lusaka, iii-vi.1956 (*King*); 1 ♂ paratype, SOUTHERN RHODESIA: Salisbury distr., Marlborough, i.1952 (*Lockbill*); 1 ♂ paratype, SOUTHERN RHODESIA: Salisbury distr., Widdecombe Park, 14.i.1950 (*Whellan*); 1 ♂ paratype, SOUTHERN RHODESIA: Salisbury distr., Widdecombe Park, 28.i.1948 (*Whellan*); 1 ♀ paratype, SOUTHERN RHODESIA: Salisbury distr., Widdecombe Park, 4.iii.1950 (*Whellan*); 1 ♀ paratype, SOUTHERN RHODESIA: Salisbury distr., Hatfield, 27.ii.1952 (*Whellan*).

TANGANYIKA: Tukuyu, 5,084 ft., ii.1924 (*Miller*) (2 ♂); Tukuyu, 21.viii.1924 (*Miller*) (1 ♂); BELGIAN CONGO: Katanga, xii.1927 (*Burr*) (2 ♂); Elisabethville, iv.1939 (*Brédo*) (2 ♂) (Mus. Congo Belge); Elisabethville-Lubumbashi, v.1929 (*Seydel*) (2 ♂) (Mus. Congo Belge); Elisabethville, xi.1911 (*Miss. Agric.*) (1 ♂) (Mus. Congo Belge); Jadotville, 1948 (*Adelaide*) (1 ♂) (Mus. Congo Belge); Kinda, v-xii.1914 (*Charliers*) (1 ♂, 3 ♀) (Mus. Congo Belge); Lubumbashi, 20.v.1911 (*Stappers*) (1 ♂) (Mus. Congo Belge); Kasenga, xii.1937 (*Brédo*) (1 ♂, 1 ♀) (Mus. Congo Belge); Chunda, 20.xii.1907 (*Neave*) (1 ♂) (Mus. Congo Belge); Gandajika, xi-xii.1950 (*Francoen*) (2 ♂, 3 ♀) (Mus. Congo Belge); Kaniama, 1931 (*Massart*) (1 ♀) (Mus. Congo Belge); Nyangwe (*Mayné*) (1 ♀) (Mus. Congo Belge); Sankuru, Gandajika, 1953 (*Francoen*) (2 ♀) (Mus. Congo Belge); Sankuru, Gandajika, 30.vi.1950 (*Francoen*) (1 ♀) (Mus. Congo Belge); Lualaba, Kolwezi, iv.1954 (*Gilbert*) (1 ♀) (Mus. Congo Belge); Lualaba, Kolwezi, 15.iv.1953 (*Gilbert*) (1 ♂) (Mus. Congo Belge); Urundi, Bururi Makamba, 11-13.xii.1949 (*Laurent*) (1 ♀) (Mus. Congo Belge); ANGOLA: Moxico distr., R. Luena, Katula, 18.v.1927 (*Burr*) (1 ♂, 1 ♀); Moxico distr., Busaco, 25.vi.1927 (*Burr*) (1 ♂); Moxico distr., R. Camasamba, trib. of R. Lumeje, 11.vi.1927 (*Burr*) (1 ♀); Kalukembe, xii.1932 (*Miss. sc. suisse*) (1 ♀); NORTHERN RHODESIA: Congo Border, Kipushi, 9.iv.1928 (*Evans*) (1 ♂); Congo Border, Tshinsenda, 27.viii.1928 (*Evans*) (1 ♂); Kipushi,



2.i.1928 (*Burr*) (1 ♀); SOUTHERN RHODESIA: Salisbury, 1894 (*Marshall*) (1 ♂) (S. A. Mus.); Salisbury, 5,000 ft., ii-vi.1900 (*Marshall*) (2 ♂); Salisbury, 5,000 ft., x.1899 (*Marshall*) (1 ♂); Salisbury, 1905 (*Marshall*) (1 ♂); Salisbury, ii.1901 (*Marshall*) (1 ♀); Salisbury (*Dodds*) (1 ♀) (S. A. Mus.); Salisbury, 27.v.1912 (—) (1 ♀) (coll. Whellan); Salisbury, light trap, 7-8.ii.1957 (*Whellan*) (1 ♂) (coll. Whellan); Salisbury, Hatfield, on Aloe plant, 30.i.1957 (*Whellan*) (1 ♀) (coll. Whellan).

In the British Museum (Natural History) unless otherwise stated.

DISTRIBUTION. *H. media* sp. n. is distributed over much of Rhodesia, south-west Tanganyika, southern Belgian Congo, and the extreme east of Angola. The northernmost record is based on a female from Urundi, but the occurrence of this species at this latitude cannot be definitely established in the absence of the male sex.

### 8. *Horatosphaga stylifera* (Karny, 1910) comb. n.

*Pantolepta stylifera* Karny, 1910, *Denkschr. med.-naturw. Ges. Jena*, 16: 51.

Holotype ♂, SOUTH-WEST AFRICA: Windhoek (*Gentz*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 22. Subgenital plate as in Text-fig. 65.

♀ unknown.

#### MEASUREMENTS

##### *Males*

Total length (5): 40.5-42.9, mean 41.96.

Median length of pronotum (5): 4.6-5.2, mean 4.87.

Length of hind femur (4): 25.7-29.5, mean 27.70.

Length of fore wing (5): 30.9-34.4, mean 32.72.

DISCUSSION. The subgenital plate of the male of this species is approached in shape by that of *H. linearis* (Rehn) and *H. longipes* (Bolivar), but the wing-venation is quite different and the terminal dorsal spine of the hind femora is almost or entirely absent.

#### MATERIAL EXAMINED

♂ holotype.

SOUTH-WEST AFRICA: Tsumeb, 1924 (*Brown*) (1 ♂) (S. A. Mus.); Okovango, Kuring Kuru, ii.1923 (*Dickman*) (1 ♂) (S. A. Mus.); ANGOLA: Tchitunda (—) (2 ♂).

In the British Museum (Natural History) unless otherwise stated.

DISTRIBUTION *H. stylifera* (Karny) is probably confined to South West Africa and Angola.

### 9. *Horatosphaga stuhlmanni* (Karsch, 1896) comb. n.

*Conchotopoda stuhlmanni* Karsch, 1896, *Stettin ent. Ztg.* 57: 329. Holotype ♂, UGANDA (?): Buginda, 11.vii.1894 (*Stuhlmann*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

*Horatosphaga* (?) *kasindina* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5: 160. Holotype ♀, BELGIAN CONGO: Kasindi, i. 1908. In the Zoologisches Museum of the Humboldt-Universität, Berlin. *Syn. n.*

DIAGNOSIS. ♂. Venation of fore wings as in Text-figs. 23 and 24; stridulatory rib of left fore wing long and conspicuous. Subgenital plate as in Text-figs. 66 and 67.

♀. Venation of fore wings as in Text-fig. 87. Ovipositor as in Text-fig. 108.

#### MEASUREMENTS

##### *Males*

Total length (10): 31.7–41.5, mean 34.50.

Median length of pronotum (10): 4.6–5.5, mean 5.09.

Length of hind femur (10): 23.5–28.5, mean 25.78.

Length of fore wing (10): 23.9–33.9, mean 26.91.

##### *Females*

Total length (13): 29.4–35.8, mean 31.70.

Median length of pronotum (12): 5.0–6.7, mean 5.62.

Length of hind femur (12): 22.0–26.2, mean 23.85.

Length of fore wing (13): 23.3–27.3, mean 24.39.

Length of ovipositor (13): 9.3–11.4, mean 10.33.

DISCUSSION. The males of this species may be recognized by their wing-venation and the simple form of the subgenital plate. The females have relatively broader fore wings than *H. linearis* (Rehn) and *H. longipes* (Bolivar), and these organs lack the dark spots shown by the latter (and often the former) species; this sex may be distinguished from *H. leggei* (Kirby) by the much longer ovipositor.

Male specimens from the more southerly parts of the range (south of the equator) have very much shorter wings than is the case further north (cf. Text-figs. 23 and 24); the females show a similar tendency, though much less well marked. It will doubtless later be possible to delimit a southern subspecies, but the material available at present is quite inadequate for this purpose.

The holotype of *H. kasindina* Rehn was examined and found to be taxonomically indistinguishable from females of *H. stuhlmanni* (Karsch). It is rather unfortunate that this specimen comes from a locality almost on the equator, where the males may be intermediate in wing-length between the two forms mentioned above. If, therefore, the southern form is later given a subspecific name, it would be desirable for it to be given a new name and to be based on a male holotype from the vicinity of Lake Kivu.

#### MATERIAL EXAMINED

♂ holotype. ♀ holotype of *Horatosphaga kasindina* Rehn.

BELGIAN CONGO: Mabende, between Beni and Rutshuru, xii. 1935 (*Brédo*) (4 ♂, 5 ♀) (Mus. Congo Belge); Rutshuru, v. 1937 (*Ghesquière*) (1 ♂) (Mus. Congo

Belge); Kivu, Buseregenye, ix.1929 (*Luja*) (2 ♂, 1 ♀) (Mus. Congo Belge); Rutshuru, 8.v.1936 (*Lippens*) (1 ♂) (Mus. Congo Belge); Lake Kivu, Rwankwi (*Leroy*) (1 ♀) (Mus. Congo Belge); Lake Albert, Kasenyi, savannah bush, viii.1935 (*Johnston*) (1 ♀); Semliki Valley, Geti Falls, open bush, x.1945 (*Johnston*) (1 ♀); Semliki Valley, Atibu Falls, open bush, x.1935 (*Johnston*) (1 ♀); Mahagi Port, short grass plains near lake, 28.ix.1935 (*Johnston*) (1 ♂, 1 ♀).

In the British Museum (Natural History) unless otherwise stated.

**DISTRIBUTION.** This species is apparently confined to the Albert-Edward-Kivu rift-valley.

#### 10. *Horatosphaga somali* (Schulthess, 1898) comb. n.

*Peronura somali* Schulthess, 1898, *Ann. Mus. Stor. nat. Genova*, 39 : 200. Holotype ♀, SOMALIA : Lugh, iv-v.1893 (*Ruspoli*). In the Museo Civico di Storia Naturale, Genoa.

*Rhegmatopoda peeli* Burr, 1900, *Proc. zool. Soc. Lond.* 1900 : 44. Holotype ♂, BRITISH SOMALILAND : Whardi Datal, 26.vii.1895 (*Peel*). In the University Museum, Oxford. **Syn. n.**

**DIAGNOSIS.** ♂. Fore wings of transparent texture; venation as in Text-fig. 25. Subgenital plate as in Text-fig. 68.

♀. Fore wings much reduced; venation as in Text-fig. 88. Ovipositor as in Text-fig. 109.

#### MEASUREMENTS

##### *Males*

Total length (7) : 38.5-43.4, mean 41.49.

Median length of pronotum (7) : 4.7-5.8, mean 5.19.

Length of hind femur (5) : 26.6-29.4, mean 27.48.

Length of fore wing (6) : 29.5-33.9, mean 32.75.

##### *Females*

Total length (3) : 25.2-26.8, mean 26.07.

Median length of pronotum (2) : 6.0-6.6, mean 6.30.

Length of hind femur (3) : 26.0-27.7, mean 26.90.

Length of fore wing (3) : 18.2-18.7, mean 18.40.

Length of ovipositor (3) : 8.6-8.8, mean 8.70.

**DISCUSSION.** The extreme transparency of the male fore wings of this species is approached only by *H. magna* sp. n. and *H. serrifera* Schaum. The former of these two species is much larger than *H. somali* (Schulthess); the latter of the two is not known from north of the equator and differs in wing-venation, male subgenital plate, and ovipositor.

Females of this species often have a white band along the anterior margin of the fore wing; the veins are sometimes brown in colour, thus contrasting with the general green colour of the remainder of the wing. The brown coloration of the wing-veins is also shown by some female specimens of *H. diminuta* (Chopard) and *H. ruspolii* (Schulthess), and is usually associated with brown pigmentation along the top of the head and pronotum. This type of colour variation seems to be connected with deserticolous habits.

Dr. F. Capra of the Museo Civico di Storia Naturale, Genoa, has very kindly sent me a photograph and description of the female holotype of this species. The extreme similarity between the females of *H. diminuta* (Chopard), *H. ruspolii* (Schulthess), and the present species, made it difficult to be certain which species this holotype represents. The sexual dimorphism shown by the genus has, furthermore, made it no easy task to associate female specimens with the male holotype of *Rhegmatopoda peeli* Burr (which was available for study). A very careful comparison has, however, been made, and the synonymy of the latter species with *H. somali* (Schulthess) was established on this basis.

#### MATERIAL EXAMINED

♂ holotype of *Rhegmatopoda peeli* Burr.

BRITISH SOMALILAND: Bohotlewein, 26.x.1952 (*Stephenson*) (1 ♂); Haud, 8° 28' N., 45° 38' E., 2,500 ft., night, 25.v.1932 (*Taylor*) (1 ♂); Hargeisa, 5.vi.1957 (*Roffey*) (1 ♂); Las Anod, 16.xi.1935 (*Peck*) (1 ♀); SOMALIA: Lugh Ferrandi, 11.xi.1953 (*Popov*) (1 ♂); ETHIOPIA: Danot, 25.xi.1953 (*Popov*) (3 ♂); N. Ogaden, El Rago, 26.xi.1953 (*Popov*) (2 ♀).

All in the British Museum (Natural History).

DISTRIBUTION. *H. somali* (Schulthess) is confined to the acacia semi-desert of eastern Africa.

#### 11. *Horatosphaga magna* sp. n.

Holotype ♂, ETHIOPIA: Ogaden, nr. Scillare, 23.xi.1953 (*Popov*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Fore wings exceeding 50 mm. in length; venation as in Text-fig. 26. Subgenital plate as in Text-fig. 69.

♀. Fore wings exceeding 40 mm. in length; venation as in Text-fig. 89. Ovipositor as in Text-fig. 110.

DESCRIPTION. ♂. Fastigium of vertex sloping to frons, sulcate above.

Pronotum without lateral carinae. Fore femora with about 10–15 external spinules. Tympanic auricles of fore tibiae moderately to strongly inflated. Mid femora with about 11–18 external spinules. Fore and mid femora usually with dorsal ridge at apex, not ending in point. Hind femora with about 10–20 external spinules; terminal dorsal spine absent or almost so. Hind tibiae with about 20–40 external dorsal spines. Fore wings of shiny and rather transparent texture; venation as in Text-fig. 26.

Tenth abdominal tergite unmodified. Supra-anal plate flap-like, rounded or tending to be triangular. Cerci moderately robust, apex incurved and pointed. Subgenital plate as in Text-fig. 69.

General coloration green. Top of head, antennae, disc of pronotum, greater part of legs, stridulatory organ, and parts of abdomen, reddish brown.

♀. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae, though showing tendency towards their formation posteriorly.

Armature of legs as in male, except that all femora often have terminal dorsal points and hind femora have about 17-23 external spinules. Tympanic auricles of fore tibiae not inflated; tympanic apertures slit-like. Venation of fore wings as in Text-fig. 89.

Ovipositor as in Text-fig. 110; margins crenulate in distal half.

General coloration green. Top of head, antennae, disc of pronotum, and parts of legs, with variable amount of reddish brown (sides of pronotal disc sometimes black). Anterior edge of fore wings usually whitish, especially near base.

## MEASUREMENTS

### *Males*

Total length (4) : 56.9-61.2, mean 58.92.

Median length of pronotum (4) : 7.1-7.9, mean 7.54.

Length of hind femur (5) : 35.9-40.0, mean 38.36.

Length of fore wing (4) : 46.2-50.7, mean 48.42.

### *Females*

Total length (4) : 48.1-57.8, mean 51.30.

Median length of pronotum (4) : 8.3-9.1, mean 8.77.

Length of hind femur (4) : 35.9-40.6, mean 38.58.

Length of fore wing (4) : 36.6-46.4, mean 40.65.

Length of ovipositor (4) : 12.9-14.3, mean 13.70.

VARIATION. There is much variation in the armature of the legs. The degree of inflation of the tympanic auricles of the male fore tibiae is variable. The extent to which the terminal dorsal point of the female femora is developed varies greatly, and it is possible that this feature may be sometimes present in males. The male subgenital plate is rather variable in shape. The coloration varies greatly: the brown colouring is sometimes almost absent.

DISCUSSION. *H. magna* sp. n. is the largest known species of the genus. The males have the general appearance of a much larger version of *H. somali* (Schulthess); apart from size, the venation of the fore wings enables the males of these two species to be easily distinguished (cf. Text-figs. 25 and 26). The fore wings of the females of *H. magna* sp. n. are well developed, unlike the reduced female fore wings of *H. somali* (Schulthess).

This species appears to be quite closely related to *H. serrifera* Schaum; the chief differences lie in the male subgenital plate and the shape of the female fore wings. It seems very likely that *H. magna* sp. n. has developed comparatively recently from a deserticolous subspecies of *H. serrifera* Schaum. The range of the latter species extends over the whole of the low grass savanna and dry woodland of south and central Africa, but reaches its northernmost point at the southern limit of the semi-desert of eastern Africa. As far as is known at present, the two species are completely allopatric.

## MATERIAL EXAMINED

♂ holotype ; 3 ♂ and 2 ♀ paratypes, same data as holotype ; 1 ♂ paratype, ETHIOPIA : Danot, 25. xi. 1953 (*Popov*).

KENYA : Marsabit, Chopa Gof, 02° 25' N., 38° 03' E., scrubby bushes, 13. vi. 1946 (*Kevan*) (2 ♀).

All in the British Museum (Natural History).

DISTRIBUTION. *H. magna* sp. n. probably occurs over a large part of the acacia semi-desert area of eastern Africa.

12. *Horatosphaga elongata* (Rehn, 1914) comb. n.

*Conchotopoda elongata* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5: 163. Holotype ♂, BELGIAN CONGO : Usumbura, xi-xii. 1907 (*von Stegmann & Stein*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

? *Horatosphaga* (?) *kandti* Rehn, 1914, *Wiss. Ergebn. Zentral-Afrika-Exp.* 5: 167. Holotype ♀, BELGIAN CONGO : Lake Kivu (*Kandi*). In the Zoologisches Museum of the Humboldt-Universität, Berlin. (See below.)

DIAGNOSIS. ♂. Venation of fore wings as in Text-figs. 27 and 28. Hind femora with dorsal ridge at apex, usually ending in spine or point. Subgenital plate as in Text-fig. 70.

♀ unknown (but see below).

MEASUREMENTS (mostly unavailable due to poorness of material)

*Males*

Median length of pronotum (2) : 4.8-5.5, mean 5.15.

Length of hind femur (2) : 25.4-28.3, mean 26.85.

DISCUSSION. This species occupies a rather anomalous position in the genus. Although quite a large amount of material of *Horatosphaga* Schaum has been available for study from the provinces of Kivu, Ruanda, and Urundi, no specimens have been found which correspond exactly with the holotype (locality : Usumbura) or paratype (locality : Lake Kivu) of *H. elongata* (Rehn). Four male specimens from this part of Belgian Congo, however, differ only by their shorter wings, and probably represent a rather brachypterous form of the species. In the fore wings of three of these specimens (from Uvira and Costermansville, Kivu, and Nyangwe, Ruanda)  $R_s$  is unbranched ; in the fourth (from Kahondo, Kivu) this vein is branched, though not so distinctly as in the holotype and paratype (cf. Text-figs. 27 and 28).

The simple form of the male subgenital plate of this species is approached by *H. stuhlmanni* (Karsch). In view of the fact that the latter species already shows considerable geographical variation in wing-length, it is just possible that *H. elongata* (Rehn) is another extreme variant of it.

As the female holotype of *H. kandti* Rehn bears the same data as the male paratype of *H. elongata* (Rehn), and these two specimens are the only ones of the genus collected on this expedition to do so, it seems quite likely that the former specimen

is a female of the present species. However, this female specimen is indistinguishable from females of *H. linearis* (Rehn), which are also known from the same locality, and it is quite impossible to establish a definite synonymy at this stage of our knowledge of the group.

#### MATERIAL EXAMINED

♂ holotype ; ♀ paratype, BELGIAN CONGO : Lake Kivu (Kandt) (same depository as holotype). ♀ holotype of *H. kandti* Rehn.

BELGIAN CONGO : Kivu, Uvira, xii.1952 (*Basilewsky*) (1 ♂) (Mus. Congo Belge); Kivu, Kahondo, 29.v.1938 (*Hendrickx*) (1 ♂) (Mus. Congo Belge); Kivu, Costermansville, 1951 (*Bomans*) (1 ♂) (Mus. Congo Belge); Ruanda, Nyangwe, viii-xi.1946 (*Scholl*) (1 ♂) (Mus. Congo Belge).

DISTRIBUTION. The known distribution of this species is confined to the provinces of Kivu, Ruanda, and Urundi.

### 13. *Horatosphaga regularis* (Bolivar, 1922) comb. n.

*Eupantolepta regularis* Bolivar, 1922, *Voy. M. Rothschild E. Afr. Anim. Art.* 1: 200. Holotype ♂, KENYA : south of Lake Rudolph, 1905 (*Rothschild*). In the Muséum National d'Histoire Naturelle, Paris.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 29. Subgenital plate as in Text-fig. 71.

♀ unknown.

#### MEASUREMENTS

##### *Males*

Total length (1) : 42.2.

Median length of pronotum (1) : 5.3.

Length of hind femur (1) : 25.0.

Length of fore wing (2) : 29.4-32.7, mean 31.05.

DISCUSSION. This species resembles *H. elongata* (Rehn) in its wing-venation, and is equally puzzling in its status. Although a few specimens from various localities in eastern Africa bear quite a close resemblance to the holotype, none corresponds exactly and only one specimen, from Kenya, can be regarded with any confidence as being conspecific. The possibility that these two specimens represent a form of *H. elongata* (Rehn) cannot be ruled out. A third specimen, from the Rukwa Valley, Tanganyika, may also belong to this complex, and rather suggests that the group may be confined in distribution to the rift-valleys of eastern Africa.

It is just possible that the holotype of *Plegmatoptera reticulata* Karsch, 1888 (type locality ; Lake Tanganyika) is a female of this species. *H. regularis* (Bolivar) is the only species of the genus occurring in this part of Africa of which the female is not yet known, and the dimensions of the holotype of *P. reticulata* Karsch, which are given below, conform quite well with this possibility.

*Plegmatoptera reticulata* Karsch, 1888, *Berl. ent. Z.* 32: 429. Holotype ♀, TANGANYIKA: Lake Tanganyika (*Reichard*). In the Zoologisches Museum of the Humboldt Universität, Berlin.

Measurements of holotype (total length unmeasurable).

Median length of pronotum : 5.7.

Length of hind femur : 28.9.

Length of fore wing : 25.0.

Length of ovipositor : 18.0.

#### MATERIAL EXAMINED

♂ holotype.

KENYA : —, 18.xi.1919 (—) (1 ♂) (British Museum (Natural History)).

DISTRIBUTION. The two known specimens of this species are from Kenya.

#### 14. *Horatosphaga concava* sp. n.

Holotype ♂, UGANDA : Gulu, v.1925 (*Carpenter*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Tenth abdominal tergite enlarged, markedly emarginate posteriorly (Text-fig. 79). Venation of fore wings as in Text-fig. 30;  $R_s$  unbranched. Subgenital plate as in Text-fig. 72, with rounded lobes.

♀ unknown.

DESCRIPTION. ♂. Fastigium of vertex sloping to frons, sulcate above.

Pronotum without lateral carinae. Fore femora with about 7–8 external spinules. Tympanic auricles of fore tibiae moderately inflated. Mid femora with about 8–12 external spinules. Fore and mid femora with dorsal ridge at apex, ending in small point or spine. Venation of fore wings as in Text-fig. 30;  $R_s$  unbranched.

Tenth abdominal tergite enlarged, markedly emarginate posteriorly (Text-fig. 79). Supra-anal plate rounded, flap-like. Cerci moderately robust, apex incurved and pointed. Subgenital plate as in Text-fig. 72, with rounded lobes.

General coloration green, with red-brown markings on fastigium of vertex, sides of pronotal disc and top of abdomen, and with red-brown spots on pronotal disc and abdominal tergites. Tips of cerci dark brown.

♀ unknown.

#### MEASUREMENTS

##### *Male*

Total length : 35.2.

Median length of pronotum : 4.9.

Length of fore wing : 28.2.

VARIATION. The two known specimens of this species do not differ from each other in any important respect.

DISCUSSION. The excised tenth abdominal tergite is found elsewhere in the genus only in the two brachypterous species *H. nomima* (Karsch) and *H. montivaga* (Sjöstedt). The hind legs were missing in both the available specimens.



## MATERIAL EXAMINED

♂ holotype.

SUDAN : Gell River Post, 70 miles from Bahr-el-Gebel, 5° 54' N., 30° 45' E., 1923 (*Moysey*) (1 ♂) (British Museum (Natural History)).

DISTRIBUTION. *H. concava* sp. n. is quite possibly confined to southern Sudan and the extreme north-west of British East Africa.

15. *Horatosphaga nuda* sp. n.

Holotype ♂, SUDAN : Imatong Mtns., Kippia, 9,000 ft., 10.ii.1936 (*Johnston*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Fore wings less than 25 mm. in length, tapering to more or less acute tip; venation as in Text-fig. 31. Hind wings rudimentary. Subgenital plate as in Text-fig. 73.

♀. Venation of fore wings as in Text-fig. 90. Ovipositor as in Text-fig. III.

DESCRIPTION. ♂. Fastigium of vertex sloping steeply to frons, sulcate above. Pronotum without lateral carinae. Femora unarmed. Tympanic auricles of fore tibiae hardly inflated. Fore and mid femora with slight dorsal ridge at apex, not ending in point; hind femora without terminal dorsal spine. Hind tibiae with about 14 external dorsal spines. Fore wings tapering to more or less acute tip; venation as in Text-fig. 31.

Tenth abdominal tergite unmodified. Supra-anal plate rounded, flap-like. Cerci relatively long, moderately robust, apex sharply incurved. Subgenital plate as in Text-fig. 73.

General coloration probably green. Disc of pronotum brown.

♀. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae. Femora unarmed or with few very small ventral spinules. Tympanic auricles of fore tibiae not inflated; tympanic apertures slit-like. Venation of fore wings as in Text-fig. 90.

Ovipositor as in Text-fig. III; margins crenulate in distal half.

General coloration probably green. Disc of pronotum brown. Anterior margin of fore wings whitish.

## MEASUREMENTS

*Males*

Total length (2) : 25.0-25.6, mean 25.30.

Median length of pronotum (1) : 5.3.

Length of hind femur (1) : 19.2.

Length of fore wing (2) : 19.9-20.8, mean 20.35.

*Females*

Total length (5) : 24.4-27.3, mean 26.24.

Median length of pronotum (4) : 5.3-5.4, mean 5.32.

Length of hind femur (6) : 17.6-19.7, mean 18.85.

Length of fore wing (5) : 18.0-20.8, mean 19.68.

Length of ovipositor (5) : 11.7-12.7, mean 12.30.

VARIATION. Some females have a few very small ventral spinules on all three pairs of femora : others have no femoral armature. The femora of the male holotype are all unarmed, but it is likely that some males have some very small femoral spinules as in the females.

DISCUSSION. The complete, or almost complete, absence of femoral armature is shared within the genus only by *H. meruensis* (Sjöstedt) ; the males of these two species also correspond in their rudimentary hind wings. The venation of the fore wings enables both sexes of the two species to be distinguished from each other.

A male specimen from Karamoja, Uganda, was found to differ from the holotype of *H. nuda* sp. n. only in having the femora armed with spines, as is usual in the genus. Other differences are extremely slight, and it seems quite possible that the two specimens are conspecific. If this is so the lack of femoral armature in the holotype may well be a subspecific character. This problem can only be settled when more material is available and the relation between the individual and geographical components of the variation can be assessed.

#### MATERIAL EXAMINED

♂ holotype ; 2 ♀ paratypes, same data as holotype ; 4 ♀ paratypes, SUDAN : Imatong Mtns., Kippia, 9,500 ft., ii. 1936 (*Johnston*).

All in the British Museum (Natural History).

DISTRIBUTION. This species is known definitely only from the type locality. The discussion above, however, suggests that the range may include northern Uganda.

#### 16. *Horatosphaga meruensis* (Sjöstedt, 1909) comb. n.

*Plegmatoptera meruensis* Sjöstedt, 1909, *Wiss. Ergebn. Schwed. Zool. Expän. Kilimandjaro, Meru*, 1905-06, 17 : 130. Lectotype ♂, TANGANYIKA : Mt. Meru, Ngare na nyuki, i. 1906 (*Sjöstedt*). 4 ♂ syntypes and 3 ♀ syntypes, at least one of which is from TANGANYIKA : Kilimanjaro, Kibonoto, i-iv. 1906 ; those not from this locality are from locality of lectotype. Lectotype and most of syntypes in the Naturhistoriska Riksmuseum, Stockholm.

DIAGNOSIS. ♂. Fore wings less than 25 mm. in length, tapering to slender tip ; venation as in Text-fig. 32. Hind wings rudimentary. Subgenital plate as in Text-fig. 74.

♀. Venation of fore wings as in Text-fig. 91. Ovipositor as in Text-fig. 112.

#### MEASUREMENTS

##### *Male*

Total length : 22.4.

Median length of pronotum : 4.3.

Length of hind femur : 20.4.

Length of fore wing : 18.9.

##### *Females*

Total length (2) : 25.1-27.2, mean 26.15.

Median length of pronotum (2) : 4.2-4.7, mean 4.45.

Length of hind femur (2) : 19.0-20.4, mean 19.70.

Length of fore wing (2) : 20.4-21.6, mean 21.00.

Length of ovipositor (2) : 9.5-9.5, mean 9.50.

DISCUSSION. The characteristics of *H. meruensis* (Sjöstedt) and its relationship to *H. nuda* sp. n. are discussed under that species.

I have selected and marked a male lectotype from among the syntypes of this species; this specimen already carried a red type label.

MATERIAL EXAMINED

♂ lectotype; 2 ♀ syntypes, same data as lectotype.

DISTRIBUTION. Known only from the type localities.

17. *Horatosphaga nomima* (Karsch, 1896) comb. n.

*Peronura nomima* Karsch, 1896, *Stettin ent. Ztg.* 57 : 327. 1 ♂ syntype, TANGANYIKA: Mpwapwa, 5.vi.1890 (*Stuhlmann*); 2 ♀ syntypes, TANGANYIKA: Mpwapwa, 7.vi.1890 (*Stuhlmann*). Both in the Zoologisches Museum of the Humboldt-Universität, Berlin.

DIAGNOSIS. ♂. Tenth abdominal tergite emarginate posteriorly (similar to Text-fig. 80). Venation of fore wings as in Text-fig. 33. Subgenital plate as in Text-fig. 75.

♀ No material available.

MEASUREMENTS

*Male*

Total length : 30.7.

Median length of pronotum : 5.8.

Length of hind femur : 25.2.

Length of fore wing : 24.0.

DISCUSSION. The emarginate tenth abdominal tergite of the male of this species is found elsewhere in the genus (apart from the fully winged *H. concava* sp. n.) only in *H. montivaga* (Sjöstedt); it differs from the latter species in lacking the verrucose pronotal disc and the black spots on the fore wings.

A male specimen in the British Museum (Natural History) from Mroke, Tanganyika, probably belongs to this species, though being of quite considerably larger size (median length of pronotum : 7.0; length of hind femur : 30.0; length of fore wing : 25.4).

MATERIAL EXAMINED

♂ syntype.

DISTRIBUTION. This species, though known for certain only from the type locality, probably occurs over a large area of Tanganyika.

18. *Horatosphaga montivaga* (Sjöstedt, 1909) comb. n.

*Peronura montivaga* Sjöstedt, 1909, *Wiss. Ergebn. Schwed. Zool. Expdn. Kilimandjaro, Meru*, 1905-06, 17 : 129. Lectotype ♂, TANGANYIKA: Kilimanjaro, Kibonoto, iii.1906 (*Sjöstedt*). 4 ♂ syntypes and 3 ♀ syntypes, at least one of which is from TANGANYIKA: Mt. Meru, xii.1905-i.1906; those not from this locality are from locality of lectotype. Lectotype and most of syntypes in the Naturhistoriska Riksmuseum, Stockholm.

DIAGNOSIS. ♂. Tenth abdominal tergite emarginate posteriorly (Text-fig. 80). Fore wings with small dark spots; venation as in Text-fig. 34. Subgenital plate as in Text-fig. 75. Pronotal disc markedly verrucose.

♀. Fore wings with small dark spots ; venation as in Text-fig. 92. Ovipositor as in Text-fig. 113. Pronotal disc markedly verrucose.

#### MEASUREMENTS

##### *Male*

Total length : 27.4.  
 Median length of pronotum : 6.0.  
 Length of hind femur : 29.0.  
 Length of fore wing : 20.5.

##### *Female*

Total length : 29.5.  
 Median length of pronotum : 6.3.  
 Length of hind femur : 24.9.  
 Length of fore wing : 23.4.  
 Length of ovipositor : 13.9.

DISCUSSION. The verrucose pronotal disc is unique in the genus.

*H. montivaga* (Sjöstedt) may possibly be a subspecies of *H. nomima* (Karsch), which it closely resembles in every feature of taxonomic importance except the verrucose pronotal disc and spotted fore wings. It is, however, quite impossible to settle this matter with the material at present available.

I have selected and marked a male lectotype from among the syntypes of this species ; this specimen already carried a red type label.

#### MATERIAL EXAMINED

♂ lectotype ; 1 ♀ syntype, TANGANYIKA : Kilimanjaro, Kibonoto, 1,000–1,200 m., 22.iv.1906 (Sjöstedt).

DISTRIBUTION. Known only from the type localities.

#### 19. *Horatosphaga elgonis* (Chopard, 1938) comb. n.

*Peronura elgonis* Chopard, 1938, *Mém. Mus. Hist. nat., Paris*, 8 : 119. Holotype ♂, KENYA : Mt. Elgon, Elgon Saw Mill, 2,470 m., 1932–33 (*Mission Scientifique de l'Omo*). In the Muséum National d'Histoire Naturelle, Paris.

DIAGNOSIS. ♂. Tenth abdominal tergite much enlarged, forming hood over supra-anal plate (Text-fig. 53). Subgenital plate large and robust, as in Text-fig. 53. Fore wings less than 20 mm. in length, not reaching hind knees ; venation as in Text-fig. 35. Hind wings rudimentary.

♀. Hind femora less than 21 mm. in length. Venation of fore wings as in Text-fig. 93. Ovipositor as in Text-fig. 114.

#### MEASUREMENTS

##### *Males*

Total length (5) : 17.9–24.4, mean 20.76.  
 Median length of pronotum (5) : 3.9–4.1, mean 3.96.  
 Length of hind femur (5) : 17.4–20.2, mean 18.70.  
 Length of fore wing (5) : 14.0–19.3, mean 16.00.

*Females*

Total length (4) : 22.5–25.2, mean 23.92.

Median length of pronotum (4) : 4.2–5.1, mean 4.61.

Length of hind femur (4) : 16.9–19.8, mean 18.25.

Length of fore wing (4) : 17.0–19.0, mean 17.92.

Length of ovipositor (4) : 6.2–6.9, mean 6.60.

DISCUSSION. The tenth abdominal tergite of the male is unique in the genus, being much enlarged but not forming the knob-like structure shown by *H. ruspolii* (Schulthess), *H. diminuta* (Chopard), and *H. vicina* (Chopard). The only other species of *Horatosphaga* Schaum which have an enlarged tenth abdominal tergite are *H. inclusa* (Karsch) and *H. crosskeyi* sp. n., which are West African and have well-developed hind wings in the male. Females of *H. elgonis* (Chopard) may be recognized by their small size and short ovipositor.

This species is a rather aberrant member of the genus, but the basal structure of the male fore wings shows (though in a state of advanced reduction) unmistakable signs of the modifications of areas MA and Cu<sub>1a</sub> which are characteristic of *Horatosphaga* Schaum.

## MATERIAL EXAMINED

♂ holotype ; 1 ♀ paratype, KENYA : Mt. Elgon, heath zone, 3,500 m., 1932–33 (*Mission Scientifique de l'Omo*) (same depository as holotype).

KENYA : Mt. Elgon, heath zone, 10,500–11,500 ft., ii.1935 (*Edwards*) (1 ♂) ; Aberdare Range, Mt. Kinangop, 9,000 ft., 25.x.1934 (*Edwards*) (1 ♂) ; UGANDA : Mt. Elgon (—) (1 ♀) ; Butandiga, 11.i.1930 (*Hargreaves*) (1 ♂, 1 ♀) ; Kidongole, 3.xii.1910 (*Gowdey*) (1 ♀) ; N. W. Monjeri (?), 6,000–7,000 ft., 23–27.xii.1926 (*Hancock*) (1 ♂).

DISTRIBUTION. It is clear from the data given above that *H. elgonis* (Chopard) is a mountain species. Its known distribution is confined to the Aberdare Range and the vicinity of Mt. Elgon.

20. *Horatosphaga ruspolii* (Schulthess, 1898) comb. n.

*Conchotopoda ruspolii* Schulthess, 1898, *Ann. Mus. Stor. nat. Genova*, 39 : 204. Holotype ♂, KENYA : Balessa, 10.x.1893 (*Ruspoli*). In the Museo Civico di Storia Naturale, Genoa. ? *Peronura rivae* Schulthess, 1898, *Ann. Mus. Stor. nat. Genova*, 39 : 201. Holotype ♀, ETHIOPIA : Dolo, v.1893 (*Ruspoli*). In the Museo Civico di Storia Naturale, Genoa. (See below.)

*Horatosphaga trochlearis* Bolivar, 1922, *Voy. M. Rothschild E. Afr. Anim. Art.* 1 : 199. Holotype ♂, KENYA : south of Lake Rudolph, 1905 (*Rothschild*). In the Muséum National d'Histoire Naturelle, Paris. *Syn. n.*

? *Peronura viridis* Chopard, 1954, *Trans. R. ent. Soc. Lond.* 105 : 318. Holotype ♀, KENYA : Isiolo distr., Bambota, 00° 20' N., 38° 20' E., desert scrub, 6.vi.1946 (*Kevan*). In the British Museum (Natural History). (See below.)

*Peronura samburu* Kevan, 1954, *Trans. R. ent. Soc. Lond.* 105 : 320. Holotype ♂, KENYA : Samburu, Barsalinga Drift, xi.1946 (*Hamilton*). In the British Museum (Natural History). *Syn. n.*

DIAGNOSIS. ♂. Tenth abdominal tergite greatly enlarged and completely concealing supra-anal plate, as in Text-figs. 45-50. Subgenital plate large and robust, as in Text-fig. 76. Venation of fore wings as in Text-fig. 36.

♀ unknown (but see below).

#### MEASUREMENTS

##### *Males*

Total length (10) : 37.7-44.7, mean 39.96.

Median length of pronotum (9) : 4.7-5.7, mean 5.06.

Length of hind femur (5) : 24.7-28.4, mean 26.34.

Length of fore wing (10) : 29.4-35.2, mean 31.11.

##### ? *Females* (see below)

Total length (2) : 25.0-26.6, mean 25.80.

Median length of pronotum (1) : 5.9.

Length of hind femur (1) : 29.3.

Length of fore wing (2) : 17.9-19.0, mean 18.45.

Length of ovipositor (2) : 9.8-10.3, mean 10.05.

DISCUSSION. The males of this species may be recognized by the genitalia and fully developed wings. The only other species of *Horatosphaga* Schaum with this type of male genitalia are *H. diminuta* (Chopard) and *H. vicina* (Chopard), which have reduced fore wings and rudimentary hind wings.

The shape of the male tenth abdominal tergite of this species varies enormously. The series illustrated in Text-figs. 45-50 shows the gradually increasing development of the lateral lobe at the expense of the distal lobe. The extremes, Text-figs. 45 and 50, might well be regarded as distinct species in the absence of the four intermediate forms. The holotype of *Peronura samburu* Kevan agrees almost exactly with that of *H. trochlearis* Bolivar (Text-fig. 46) in the shape of this structure. The holotype of *H. ruspolii* (Schulthess) is intermediate in this respect between Text-figs. 45 and 46. A photograph, drawings, and a description of the latter specimen were kindly provided by Dr. F. Capra, of the Museo Civico di Storia Naturale, Genoa, and there is no doubt that these three holotypes are conspecific.

Although the female of *H. ruspolii* (Schulthess) is not yet known for certain, it is very probable that a female specimen (Text-figs. 94 and 115) bearing very similar data to the male from El Carre (collected the day before only a few miles away, and with similar coloration) belongs to this species. A further female bearing the same data as a male from Damassa, except for date, is probably also of this species. These females (which are very similar to females of *H. diminuta* (Chopard)) correspond closely with the female holotype of *Peronura rivae* Schulthess, a photograph and description of which were kindly supplied by Dr. Capra; a definite synonymy, however, cannot be established until more material is available. This is also true of the female holotype of *Peronura viridis* Chopard, which is very probably either the present species or *H. diminuta* (Chopard).

## MATERIAL EXAMINED

♂ holotype of *H. trochlearis* Bolivar. ♀ holotype of *Peronura viridis* Chopard.  
♂ holotype of *Peronura samburu* Kevan.

ETHIOPIA : Ogaden, El Carre, 05° 51' N., 42° 06' E., 3,000 ft., scrub, 4.vi.1947 (*Kevan*) (1 ♂); Ogaden, nr. El Mara, 05° 48' N., 42° 07' E., 2,000 ft., thorn-bush, 3.vi.1947 (*Kevan*) (1 ♀); SOMALIA : Damassa, 03° 09' N., 41° 20' E., desert grass and thorn-bush, 19.xii.1944 (*Kevan*) (2 ♂); Damassa, 03° 09' N., 41° 20' E., desert grass and thorn-bush, 24.v.1947 (*Kevan*) (1 ♀); KENYA : Wajir, desert grass and thorn-bush, 7.i.1945 (*Kevan*) (1 ♂); Garissa distr., Lak Telangor, 00° 30' N., 39° 18' E., desert grass and thorn-bush, 26.i.1944 (*Kevan*) (1 ♂); UGANDA : Turkana, 1934 (*Buxton*) (4 ♂).

All in the British Museum (Natural History).

DISTRIBUTION. The known range of this species is confined to an area of steppe and semi-desert associated with the northern border of Kenya.

21. *Horatosphaga diminuta* (Chopard, 1954) comb. n.

*Peronura diminuta* Chopard, 1954, *Trans. R. ent. Soc. Lond.* 105 : 319. Holotype ♂, KENYA : Moyale, open bush, 15.vi.1946 (*Kevan*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Tenth abdominal tergite greatly enlarged and completely concealing supra-anal plate, as in Text-figs. 51 and 52. Subgenital plate large and robust, as in Text-fig. 77. Fore wings not reaching hind knees, usually less than 25 mm. in length; venation as in Text-fig. 37. Hind wings greatly reduced or rudimentary.

♀. Venation of fore wings as in Text-fig. 95. Ovipositor as in Text-fig. 116, less than 12 mm. in length.

## MEASUREMENTS

*Males*

Total length (10) : 26.3–32.0, mean 30.14.

Median length of pronotum (14) : 4.7–6.1, mean 5.55.

Length of hind femur (15) : 22.7–28.2, mean 25.59.

Length of fore wing (13) : 18.9–25.7, mean 22.92.

*Females*

Total length (10) : 20.5–26.1, mean 23.00.

Median length of pronotum (11) : 5.6–6.6, mean 6.03.

Length of hind femur (8) : 23.4–27.8, mean 25.29.

Length of fore wing (11) : 13.3–17.8, mean 15.19.

Length of ovipositor (10) : 9.8–10.8, mean 10.39.

DISCUSSION. In the nature of the male genitalia this species is approached only by *H. vicina* (Chopard) and *H. ruspolii* (Schulthess). The latter species, however, is fully winged, and *H. vicina* (Chopard) is much larger. The similarity between *H. vicina* (Chopard) and *H. ruspolii* (Schulthess) is so close that it is quite

possible that they represent brachypterous and macropterous forms of the same species.

#### MATERIAL EXAMINED

♂ holotype; 1 ♀ paratype, same data and depository as holotype.

KENYA: Moyale, open bush, 15.vi.1946 (*Kevan*) (5 ♂, 2 ♀); Moyale, cultivation, 8-10.vi.1947 (*Kevan*) (7 ♂, 3 ♀); Moyale distr., Yasere, 03° 30' N., 38° 35' E., thorn-bush, 14.vi.1946 (*Kevan*) (2 ♀); Moyale, 1954 (*Clifford*) (1 ♂, 1 ♀); Marsabit, vi.1934 (*L.R.R.V.E.*) (4 ♂, 1 ♀).

All in the British Museum (Natural History).

DISTRIBUTION. This species is known only from a very small area of Kenya, on or near the northern border.

#### 22. *Horatosphaga vicina* (Chopard, 1954) comb. n.

*Peronura vicina* Chopard, 1954, *Trans. R. ent. Soc. Lond.* **105**: 318. Holotype ♀, KENYA: Marsabit, Chopa Gof, 02° 25' N., 38° 03' E., scrubby bushes, 13.vi.1946 (*Kevan*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Tenth abdominal tergite greatly enlarged and completely concealing supra-anal plate, similar to Text-figs. 51 and 52. Subgenital plate large and robust, as in Text-fig. 78. Fore wings not reaching hind knees, but usually more than 25 mm. in length; venation as in Text-fig. 38. Hind wings greatly reduced or rudimentary.

♀. Venation of fore wings as in Text-fig. 96. Ovipositor as in Text-fig. 117, more than 12 mm. in length.

#### MEASUREMENTS

##### *Males*

Total length (3): 32.0-35.2, mean 33.50.

Median length of pronotum (3): 6.9-7.1, mean 7.02.

Length of hind femur (3): 29.2-31.4, mean 29.97.

Length of fore wing (3): 25.0-26.9, mean 25.97.

##### *Females*

Total length (2): 23.5-27.0, mean 25.25.

Median length of pronotum (2): 7.2-7.4, mean 7.30.

Length of hind femur (1): 25.4.

Length of fore wing (2): 14.8-17.0, mean 15.90.

Length of ovipositor (1): 13.3.

DISCUSSION. This species differs from *H. diminuta* (Chopard) only in being considerably larger. The general high degree of variability in the genus suggests the possibility that *H. vicina* (Chopard) is a large form of *H. diminuta* (Chopard). However, no intermediate specimens are so far known and it is impossible to draw definite conclusions at present. (For a possible synonymy of *H. vicina* (Chopard) with *Peronura hildebrandtiana* Karsch see p. 320.)



## MATERIAL EXAMINED

♀ holotype ; 1 ♂ paratype, same data and depository as holotype.

KENYA : Marsabit, Chopa Gof, 02° 25' N., 38° 03' E., scrubby bushes, 13.vi.1946 (*Kevan*) (3 ♂, 1 ♀).

All in the British Museum (Natural History).

DISTRIBUTION. Known only from the type locality.

23. *Horatosphaga inclusa* (Karsch, 1893) comb. n.

*Pachypyga inclusa* Karsch, 1893, *Berl. ent. Z.* 38: 125. One ♂ syntype and 5 ♀ syntypes, FRENCH WEST AFRICA : Bismarckburg, xi-xii.1890 (*Büttner*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

DIAGNOSIS. ♂. Tenth abdominal tergite greatly enlarged and completely concealing supra-anal plate, as in Text-fig. 54. Cerci swollen in basal half. Subgenital plate large and robust, as in Text-fig. 54. Fore wings not reaching hind knees, usually less than 26 mm. in length ; venation as in Text-fig. 39.

♀. Fore wings less than 25 mm. in length ; venation as in Text-fig. 97. Ovipositor more than 10 mm. in length, shaped as in Text-fig. 118.

## MEASUREMENTS

*Males*

Total length (2) : 29.3-33.2, mean 31.25.

Median length of pronotum (2) : 4.8-5.4, mean 5.10.

Length of hind femur (1) : 26.9.

Length of fore wing (2) : 22.4-26.1, mean 24.25.

*Females*

Total length (4) : 30.0-32.1, mean 31.00.

Median length of pronotum (4) : 5.7-6.3, mean 6.00.

Length of hind femur (4) : 26.7-29.0, mean 27.88.

Length of fore wing (4) : 21.6-24.6, mean 23.52.

Length of ovipositor (4) : 12.6-14.0, mean 13.38.

DISCUSSION. The nature of the male genitalia of this species is approached only by that of *H. crosskeyi* sp. n., in which, however, the tenth abdominal tergite is bilobed and the fore wings are more than 25 mm. in length. Females of *H. inclusa* (Karsch) may be distinguished from those of *H. crosskeyi* sp. n. by the much larger ovipositor.

## MATERIAL EXAMINED

1 ♀ syntype.

FRENCH WEST AFRICA : Bismarckburg, i.1891 (*Büttner*) (1 ♀) (Nat. Mus. Vienna) ; GHANA : Northern Territories, Sarkwalla, 4-7.xi.1915 (*Simpson*) (2 ♂, 2 ♀) (British Museum (Natural History)).

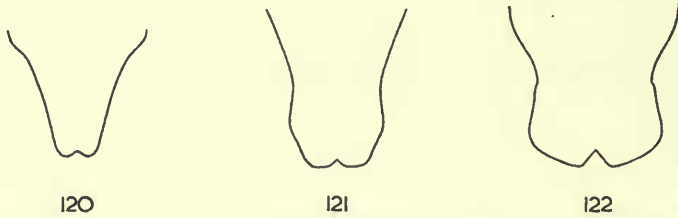
DISTRIBUTION. Though known only from the localities mentioned above, it is probable that *H. inclusa* (Karsch) also occurs over a large area to the west of Ghana. To the east it is apparently replaced by *H. crosskeyi* sp. n.

#### 24. *Horatosphaga crosskeyi* sp. n.

Holotype ♂, NIGERIA: Niger Province, Diko, 8 miles north of Abuja, iv.1956 (*Crosskey*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Tenth abdominal tergite greatly enlarged and completely concealing supra-anal plate, as in Text-figs. 120-122. Cerci moderately swollen in basal half. Subgenital plate large and robust, as in Text-fig. 55. Fore wings usually reaching hind knees, more than 25 mm. in length; venation as in Text-fig. 40.

♀. Fore wings more than 25 mm. in length; venation as in Text-fig. 98. Ovipositor less than 10 mm. in length, shaped as in Text-fig. 119.



FIGS. 120-122. Dorsal view of the male tenth abdominal tergite of *Horatosphaga crosskeyi* sp. n. from (120) Song, Adamawa Province; (121) Diko, Niger Province; (122) Azare, Azare Province.

DESCRIPTION. ♂. Fastigium of vertex sloping to frons, sulcate above.

Pronotum without lateral carinae. Fore femora with about 7-13 external spinules. Tympanic auricles of fore tibiae hardly inflated. Mid femora with about 9-13 external spinules. Fore and mid femora with dorsal ridge at apex, ending in point. Hind femora with about 9-12 external spinules; terminal dorsal spine absent. Hind tibiae with about 25-40 external dorsal spines. Venation of fore wings as in Text-fig. 40.

Tenth abdominal tergite greatly enlarged and completely concealing supra-anal plate, as in Text-figs. 120-122. Cerci moderately swollen in basal half, apex curved inwards. Subgenital plate large and robust, of variable form, as in Text-fig. 55.

General coloration green. Antennae, disc of pronotum, stridulatory organ, hind margin of fore wings, and top of abdomen, usually red-brown.

♀. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae. Armature of legs as in male. Tympanic auricles of fore tibiae not inflated; tympanic aperture slit-like. Venation of fore wings as in Text-fig. 98.

Ovipositor as in Text-fig. 119, margins crenulate in distal half.

General coloration green.

## MEASUREMENTS

*Males*

Total length (20) : 33.4-41.8, mean 36.92.  
 Median length of pronotum (20) : 4.8-5.8, mean 5.18.  
 Length of hind femur (20) : 22.6-28.4, mean 25.09.  
 Length of fore wing (20) : 26.7-32.8, mean 28.94.

*Female*

Total length : 35.9.  
 Median length of pronotum : 5.4.  
 Length of hind femur : 24.5.  
 Length of fore wing : 27.5.  
 Length of ovipositor : 8.8.

**VARIATION.** There is variation in the armature of the legs. The venation of the fore wings varies somewhat,  $R_s$  occasionally being unbranched. The tenth abdominal tergite shows enormous variation in shape (cf. Text-figs. 120-122). The intensity of the red-brown pigmentation of the males varies greatly : some specimens are almost entirely green.

**DISCUSSION.** The shape of the tenth abdominal tergite of the male of this species, though showing great geographical variations, is unique in the genus. Females may be distinguished from the only other West African species of *Horatosphaga* Schaum (*H. inclusa* (Karsch)) by the shorter ovipositor and longer fore wings.

In some respects *H. crosskeyi* sp. n. seems to represent the West African equivalent of *H. ruspolii* (Schulthess) : the males are similar in general appearance and wing-venation, and show a similar great variation in the shape of the tenth abdominal tergite. Also, *H. inclusa* (Karsch) is a closely related brachypterous derivative of *H. crosskeyi* sp. n. in much the same way as *H. diminuta* (Chopard) is related to *H. ruspolii* (Schulthess). Doubtless all four of these species have evolved comparatively recently from a common ancestor differing (in the male) from the more typical members of the genus in having an enlarged tenth abdominal tergite.

## MATERIAL EXAMINED

♂ holotype ; 1 ♂ paratype, NIGERIA : Niger Province, Diko, nr. Abuja, at light, iv-x.1956 (*Crosskey*) ; 1 ♂ paratype, NIGERIA : Niger Province, Diko, nr. Abuja, at light, xii.1956-i.1957 (*Crosskey*) ; 1 ♂ paratype, NIGERIA : Niger Province, Minna, at light, viii.1955 (*Crosskey*) ; 1 ♂ paratype, NIGERIA : Niger Province, Minna, at light, vi.1955 (*Crosskey*) ; 2 ♂ paratypes, NIGERIA : Niger Province, Minna, xi.1954 (*Crosskey*) ; 1 ♂ paratype, NIGERIA : Niger Province, Minna, at light, vii.1955 (*Crosskey*) ; 5 ♂ paratypes, NIGERIA : Adamawa Province, Song, 45 miles north of Yola, vii.1958 (*Crosskey*) ; 3 ♂ paratypes, NIGERIA : Kabba Province, Lokoja, v.1958 (*Crosskey*) ; 1 ♀ paratype, NIGERIA : Niger Province, Abuja, vi.1955 (*Crosskey*).

NIGERIA : Azare, x.1928 (*Lloyd*) (4 ♂).

All in the British Museum (Natural History).

**DISTRIBUTION.** This species is known only from Nigeria, where it is widely distributed in the Northern Provinces.

**PERONURA** Karsch, 1888

*Peronura* Karsch, 1888, *Berl. ent. Z.* 32: 426. Type species, by subsequent selection (Kirby, 1906, p. 391), *Peronura clavigera* Karsch, 1888.

DIAGNOSIS. ♂. Fore wings reduced to small lobes less than twice length of pronotum; area MA somewhat concave basally. Fastigium of frons reaching almost to top of antennal scrobes. Tympanic auricles of fore tibiae not inflated.

♀. No known diagnostic character (but see remarks below).

DESCRIPTION. ♂. Fastigium of frons reaching almost to top of antennal scrobes. Fastigium of vertex compressed, sloping steeply to frons, sulcate above.

Pronotum without lateral carinae. Fore coxae without spine. Tympanic auricles of fore tibiae not inflated. Fore wings reduced to small lobes less than twice length of pronotum; area MA somewhat concave basally. Hind wings rudimentary.

♀. As male except for area MA of fore wings, which is unmodified.

DISCUSSION. The very reduced fore wings of this monotypic genus provide the only non-sexual character to distinguish it from *Horatosphaga* Schaum. The male cerci, however, are markedly different, taking the long, acuminate form shown in Text-fig. 123; the female, moreover, has a pair of tubercles at the base of the ovipositor, protruding from an enlarged eighth abdominal tergite. Although these genitalic characters are striking, they may prove to be of importance at the specific level only, and are not therefore put forward as generic characters here. In the males the lateral pronotal lobes differ in shape from that typical of *Horatosphaga* Schaum in having no backward prolongation, but some of the brachypterous species of that genus tend to be intermediate in this respect. Ignoring sexual characters *Peronura* Karsch closely resembles some of the brachypterous species of *Horatosphaga* Schaum, and it would perhaps have been unwise to give it separate status if that genus had not already been in an uncomfortably cumbersome state. As things stand, however, it is advisable to regard *Peronura* Karsch as a distinct, though poorly defined, genus within the Acrometopae.

The species *P. hildebrandtiana* Karsch was included by this author as a second species of *Peronura* Karsch in his original description of the genus. The status of this species, still known only by the unique female holotype, must remain in doubt until males are available. *P. hildebrandtiana* Karsch does not have the tubercles at the base of the ovipositor which characterize *P. clavigera* Karsch, nor does it show the enlargement of the eighth abdominal tergite: its appearance in fact seems more suggestive of its belonging to *Horatosphaga* Schaum. There is a pronounced point at the tip of the hind femora of the type shown by many species of *Horatosphaga* Schaum and the fore wings, though reduced, are more than twice the length of the pronotum. It is quite possible that *P. hildebrandtiana* Karsch is the same species as *H. vicina* (Chopard) (p. 316), from which it differs only by the terminal spine on the hind femur (which is known to undergo marked geographical variation in the Acrometopae) and the shape of the subgenital plate (more significant but difficult to appreciate as the subgenital plate of the holotype of *P. hildebrandtiana* Karsch

has been opened out—presumably in an attempt on the part of the original author to find the tubercles which characterize *P. clavigera* Karsch). Clearly, the status of this species cannot be clarified until more material is available. The data and measurements of the holotype are given below.

*Peronura hildebrandtiana* Karsch, 1888, *Bevl. ent. Z.* **32**: 427. Holotype ♀, KENYA: Mombasa, xii, 1876 (*Hildebrandt*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

Measurements of holotype.

Total length: 27.2.

Median length of pronotum: 7.4.

Length of hind femur: 28.6.

Length of fore wing: 17.7.

Length of ovipositor: 14.2.

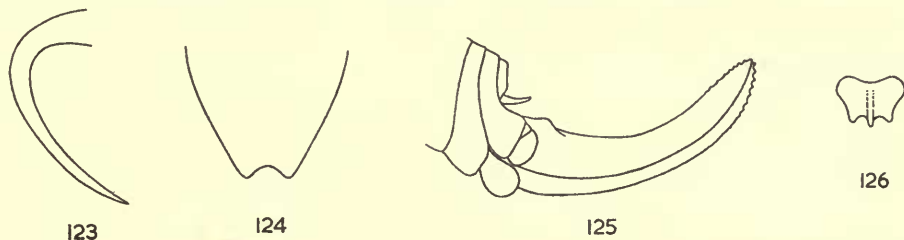
DISTRIBUTION (Text-fig. 44). *Peronura* Karsch (in the restricted sense used here) has so far not been found outside Kenya, where it appears to show a preference for the drier parts. It does not apparently extend into the driest north-eastern part of the country.

### *Peronura clavigera* Karsch, 1888

*Peronura clavigera* Karsch, 1888, *Bevl. ent. Z.* **32**: 427. Two ♀ syntypes, KENYA: Mombasa xii, 1876 (*Hildebrandt*). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

DIAGNOSIS. ♂. Cerci long and acuminate, as in Text-fig. 123. Subgenital plate as in Text-fig. 124.

♀. Ovipositor with pair of large tubercles at base, protruding from enlarged eighth abdominal tergite, as in Text-fig. 125. Subgenital plate as in Text-fig. 126.



FIGS. 123-126. *Peronura clavigera* Karsch. (123). Dorsal view of the left male cercus. (124) Ventral view of the male subgenital plate. (125) Lateral view of the ovipositor and associated structures. (126) Ventral view of the female subgenital plate.

### MEASUREMENTS

#### *Males*

Total length (4) (see remarks on p. 274): 17.7-23.4, mean 19.88.

Median length of pronotum (4): 5.0-5.7, mean 5.25.

Length of hind femur (3): 20.2-25.5, mean 22.27.

Length of fore wing (4): 4.8-5.2, mean 4.97.

## MEASUREMENTS—(cont.)

*Females*

Total length (I2) (see remarks on p. 274) : 20.0–26.8, mean 23.06.

Median length of pronotum (I2) : 5.1–6.3, mean 5.71.

Length of hind femur (I0) : 20.3–24.7, mean 22.29.

Length of fore wing (I1) : 4.2–6.5, mean 4.96.

Length of ovipositor (I2) : 10.0–13.0, mean 11.85.

DISCUSSION. As mentioned when discussing the genus, the genitalia of both sexes of this species are very characteristic. The tubercles at the base of the ovipositor (which are rarely absent, possibly through damage) are in fact probably unique in the Tettigoniidae ; their function is quite unknown.

## MATERIAL EXAMINED

One ♀ syntype.

KENYA : Lake Baringo, east, (Ford) (1 ♂) ; Samburu distr., vi.1944 (*Opiko*) (1 ♂, 2 ♀) ; Chyulu Hills, 5,200–5,600 ft. (*Coryndon Museum Exp.*) (2 ♂, 5 ♀) ; Nairobi, vi.1928 (*van Someren*) (1 ♀) ; Sultan Hamud to Makindu, 20–21.i.1954 (*Waloff*) (1 ♀) ; Mambre Estate, 26.v.1932 (*Lewis*) (1 ♀) ; N. Kamaba distr. (*Dundas*) (1 ♀).

All in the British Museum (Natural History).

DISTRIBUTION. As given for the genus.

**PROSPHAGA** gen. n.

Type species : *Pantolepta calaharica* Karny, 1910.

DIAGNOSIS. ♂. Antennal scrobes reaching above fastigium of frons, as in Text-fig. 133. Branches of  $R_s$  of fore wings ending slightly behind, not actually at, wing-tip (Text-figs. 41 and 42). Pronotum selliform. Cross-veins of fore wings arranged irregularly ; areas MA and  $Cu_{1a}$  tending to develop basal concavities as in *Horatosphaga* Schaum, but condition is not as advanced as in that genus. Tympanic auricles of fore tibiae not inflated.

♀. Antennal scrobes and tympanic auricles as in male.

DESCRIPTION. ♂. Antennal scrobes reaching above fastigium of frons, as in Text-fig. 133. Fastigium of vertex compressed, sloping steeply to frons, sulcate above.

Pronotum selliform, without lateral carinae. Fore coxae without spine. Tympanic auricles of fore tibiae not inflated. Cross-veins of fore wings arranged irregularly ; areas MA and  $Cu_{1a}$  tending to develop basal concavities as in *Horatosphaga* Schaum, but condition is not as advanced as in that genus. Branches of  $R_s$  of fore wings ending slightly behind, not actually at, wing-tip (Text-figs. 41 and 42).

Subgenital plate flattened and upcurved.

♀. As male except for wings and genitalia. Hind wings rudimentary.

DISCUSSION. The venation at the base of the male fore wings shows that this genus is closely related to *Conchotopoda* Karsch and *Horatosphaga* Schaum ; indeed, in *P. splendens* sp. n. area  $Cu_{1a}$  shows the typical form of *Horatosphaga* Schaum,

though the base of area MA has not developed completely the concavity shown by that genus. Males of *Prosphaga* gen. n. (Text-fig. 127) differ from those of *Horatosphaga* Schaum in lacking the web-like arrangement of the cross-veins, and the more prominent antennal scrobes of the former genus enable both sexes of the two genera to be distinguished. The basal pocket shown by the right male fore wing of *Conchotopoda* Karsch is not developed in *Prosphaga* gen. n. (For additional remarks concerning *Prosphaga* gen. n. see p. 273.)

DISTRIBUTION (Text-fig. 44). This genus is so far known only from Ethiopia and the eastern side of the Kalahari Desert. Both these regions have a considerably

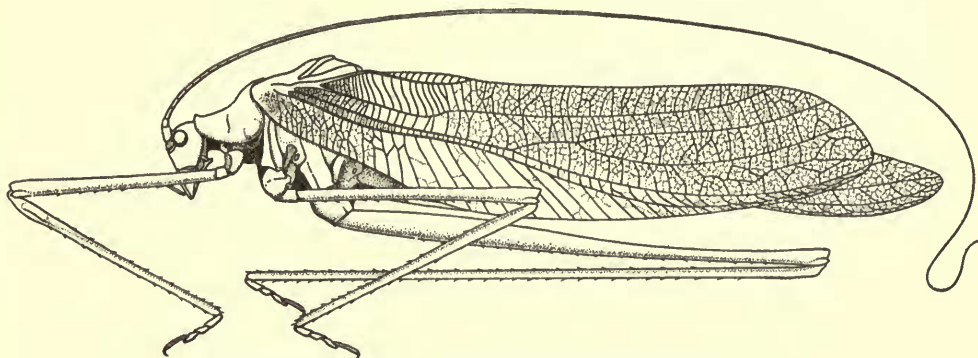


FIG. 127. *Prosphaga splendens* gen. et sp. n., male.

drier climate than the intervening area of central Africa, and it is very likely that *Prosphaga* gen. n. has a discontinuous distribution.

#### KEY TO THE SPECIES

As the female sex of one of the two species of this genus is unknown, this key is based on males only. The difference in the apex of the hind femora, however, doubtless applies to both sexes.

- |  |                                       |
|--|---------------------------------------|
| 1. Hind femora ending in a dorsal point. Total length less than 55 mm. (South Africa)    | <i>P. calaharica</i> (Karny) (p. 323) |
| -. Hind femora without a terminal dorsal point. Total length more than 55 mm. (Ethiopia) | <i>P. splendens</i> sp. n. (p. 324)   |

#### 1. *Prosphaga calaharica* (Karny, 1910) comb. n.

*Pantolepta calaharica* Karny, 1910, *Denkschr. med.-naturw. Ges. Jena*, 16: 52. Holotype ♂, SOUTH AFRICA: Bechuanaland, Kalahari, Ku Gudie, nr. Pitsani, i. 1905 (Schultze). In the Zoologisches Museum of the Humboldt-Universität, Berlin.

DIAGNOSIS. ♂. Hind femora ending in dorsal point. Tenth abdominal tergite produced somewhat posteriorly, as in Text-fig. 128, forming broad hood over most of supra-anal plate. Subgenital plate as in Text-fig. 129.

♀. Hind femora ending in dorsal point. Ovipositor as in Text-fig. 130. Venation of fore wings as in Text-fig. 131.

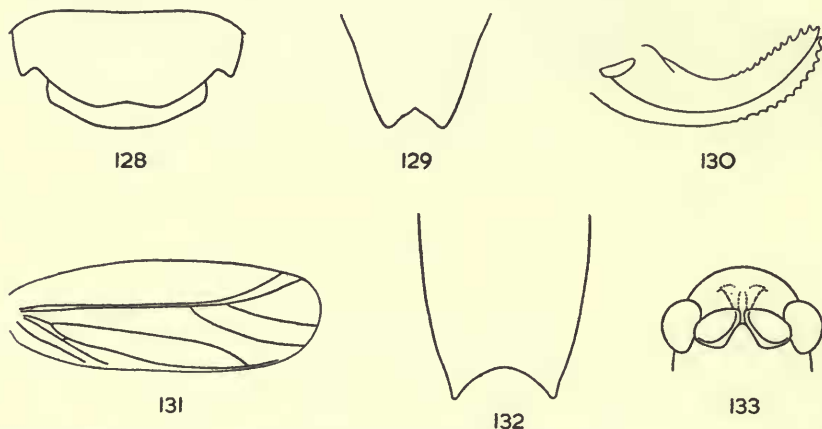
## MEASUREMENTS

*Males*

Total length (3) : 37·3–52·3, mean 46·43.  
 Median length of pronotum (3) : 5·2–5·8, mean 5·50.  
 Length of hind femur (2) : 33·3–33·6, mean 33·45.  
 Length of fore wing (3) : 36·0–40·1, mean 38·10.

*Female*

Total length : 31·0.  
 Median length of pronotum : 6·32.  
 Length of hind femur : 34·3.  
 Length of fore wing : 25·3.  
 Length of ovipositor : 10·4.



FIGS. 128–133. *Prospaha* gen. n. 128–131. *P. calaharica* (Karny), (128) dorsal view of the male tenth abdominal tergite and supra-anal plate, (129) ventral view of the male subgenital plate, (130) lateral view of the ovipositor, and (131) right female fore wing. 132–133. *P. splendens* sp. n., (132) ventral view of the male subgenital plate, and (133) anterior view of the dorsal part of the head.

DISCUSSION. The terminal point of the hind femora enables this species to be easily distinguished from *P. splendens* sp. n.

## MATERIAL EXAMINED

♂ holotype.

SOUTH AFRICA : Transvaal, junction of Crocodile and Marico rivers, ii.1918 (Tucker) (2 ♂, 1 ♀) (S. A. Mus.).

DISTRIBUTION. Known only from the eastern side of the Kalahari Desert.

2. *Prospaha splendens* sp. n.

Holotype ♂, ETHIOPIA : Wardere, 7–9.xi.1952 (Stephenson). In the British Museum (Natural History).



DIAGNOSIS. ♂. Hind femora without terminal dorsal point. Tenth abdominal tergite somewhat enlarged, otherwise unmodified. Subgenital plate as in Text-fig. 132.

♀ unknown.

DESCRIPTION. ♂. Fastigium of vertex sloping steeply to frons, sulcate above. Pronotum without lateral carinae. Fore femora with about 5-8 external spinules. Mid femora with about 10-12 external spinules. Fore and mid femora with dorsal ridge at apex, not ending in point. Hind femora with about 14-21 external spinules; terminal dorsal spine absent. Hind tibiae with about 30-35 external dorsal spines. Venation of fore wings as in Text-fig. 42.

Tenth abdominal tergite somewhat enlarged. Supra-anal plate rounded, flap-like. Cerci robust, apex incurved and pointed. Subgenital plate as in Text-fig. 132.

General coloration green. Top of head, disc of pronotum, stridulatory organ, hind edge of fore wings, and parts of legs, dark brown. Top of abdomen black. Base of costal area of fore wings whitish.

♀ unknown.

#### MEASUREMENTS

##### *Males*

Total length (8) : 61.4-70.0, mean 66.60.

Median length of pronotum (7) : 7.7-8.5, mean 8.20.

Length of hind femur (8) : 39.6-44.8, mean 42.28.

Length of fore wing (7) : 46.9-55.0, mean 52.00.

VARIATION. The armature of the legs is somewhat variable. There is a certain amount of variation in colouring, especially in the extent of the brown colour.

DISCUSSION. This species is separated geographically from the only other known species of the genus, *P. calaharica* (Karny), by most of tropical Africa; it may be distinguished from it by the lack of the terminal dorsal point on the hind femora.

#### MATERIAL EXAMINED

♂ holotype; 2 ♂ paratypes, ETHIOPIA : Wardere, 24.xi.1953 (*Popov*); 2 ♂ paratypes, ETHIOPIA : Wardere, 29.xi.1953 (*Popov*); 3 ♂ paratypes, ETHIOPIA : Ual Ual, 19.xi.1953 (*Bellehu*).

All in the British Museum (Natural History).

DISTRIBUTION. Known only from eastern Ethiopia.

### **CONCHOTOPODA** Karsch, 1887

*Conchotopoda* Karsch, 1887, *Ent. Nachr.* **13** : 44. Type species, by monotypy, *Conchotopoda belcki* Karsch, 1887.

*Rhegmatopoda* Brunner, 1891, *Additamenta zur Monographie der Phaneropteriden*, p. 44. Type species, by monotypy, *Horatosphaga leptocerca* Stal, 1876. *Syn. n.*

DIAGNOSIS. ♂. Basal region of M or right fore wing developed into posterior fold, forming pocket next to stridulatory organ (Text-fig. 4). Branches of  $R_s$  of fore wings ending on posterior wing-margin, rather than at wing-tip. Antennal scrobes reaching same level as, or slightly above, fastigium of frons, which often has

acute tip. Cross-veins of fore wings arranged irregularly; areas MA and Cu<sub>1</sub> tending to develop basal concavities as in *Horatosphaga* Schaum, but condition is not as advanced as in that genus. Tympanic auricles of fore tibiae not inflated or only slightly so.

♀. No known diagnostic character.

DESCRIPTION. ♂. Antennal scrobes reaching same level as, or slightly above, fastigium of frons, which often has acute tip. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae, not as markedly selliform as in *Prosphega* gen. n. Fore coxae without spine. Tympanic auricles of fore tibiae not inflated or only slightly so. Cross-veins of fore wings arranged irregularly; areas MA and Cu<sub>1a</sub> tending to develop basal concavities as in *Horatosphaga* Schaum, but condition is not as advanced as in that genus; basal region of M of right fore wing developed into posterior fold, forming pocket next to stridulatory organ. Branches of R<sub>s</sub> of fore wings ending on posterior wing-margin, rather than at wing-tip.

Subgenital plate not as markedly upcurved as in *Prosphega* gen. n.

♀. As male except for fore wings and genitalia. Hind wings rudimentary.

DISCUSSION. Males of this genus are characterized by the basal pocket of the right fore wing, which is doubtless concerned physiologically with stridulation. The pronotum is much less markedly selliform than in *Prosphega* gen. n. As in the latter genus the venation of the base of the male fore wings shows a relationship to *Horatosphaga* Schaum, but the base of area MA has not developed completely the concavities shown by *Horatosphaga* Schaum.

The female of this genus is known in one species only, *C. crassicauda* sp. n. It apparently shows no characters of diagnostic importance at the generic level.

The type species of this genus is clearly congeneric with *Horatosphaga leptocerca* Stal, the type species of *Rhegmatopoda* Brunner; these two species both have the characteristic basal pocket on the right fore wing of the male, and differ by no character of significance at the generic level. *Rhegmatopoda* Brunner is therefore synonymized here with *Conchotopoda* Karsch.

DISTRIBUTION (Text-fig. 44). *Conchotopoda* Karsch is known only from South and South West Africa. So far none of the species has been recorded from Cape Province except *C. grallatoria* (Stal), which has "Caffraria" as its type locality.

#### KEY TO THE SPECIES

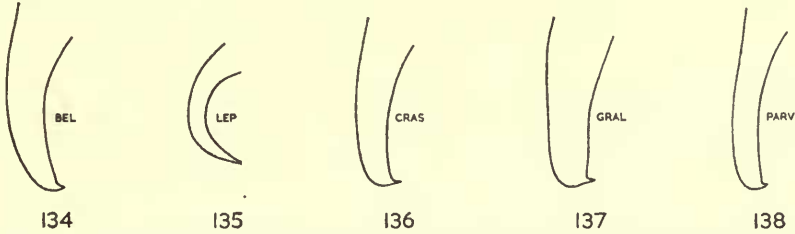
As the female sex is known in only one of the species, this key refers to males only.

- |  |                                       |
|--|---------------------------------------|
| 1. Hind wings well-developed . . . . .   | 2                                     |
| -. Hind wings rudimentary . . . . .  | 4                                     |
| 2. Fore wings more than four times longer than their maximum width, as in Text-figs. 6 and 7 . . . . . | 3                                     |
| -. Fore wings less than four times longer than their maximum width, as in Text-fig. 5 . . . . .        |                                       |
|  | <i>C. belcki</i> Karsch (p. 327)      |
| 3. Cerci as in Text-fig. 135 . . . . .   | <i>C. leptocerca</i> (Stal) (p. 328)  |
| -. Cerci as in Text-fig. 136 . . . . .   | <i>C. crassicauda</i> sp. n. (p. 328) |
| 4. Median length of pronotum more than 5.5 mm. . . . .   | <i>C. grallatoria</i> (Stal) (p. 330) |
| -. Median length of pronotum less than 5.5 mm. . . . .   | <i>C. parva</i> sp. n. (p. 330)       |

I. *Conchotopoda belcki* Karsch, 1887

*Conchotopoda belcki* Karsch, 1887, *Ent. Nachr.* 13: 44. Holotype ♂, SOUTH WEST AFRICA: Damaraland (*Belck*). Lost.

*Pantolepta morsei* Karny, 1910, *Denkschr. med.-naturw. Ges. Jena*, 16: 53. One ♂ syntype, SOUTH WEST AFRICA: Windhoek (*Techow*); 1 ♂ syntype, SOUTH WEST AFRICA: Kung-Buschmannland (*Lübbert*). In the Zoologisches Museum of the Humboldt-Universität, Berlin. *Syn. n.*



FIGS. 134-138. Dorsal view of the left male cercus of (134) *Conchotopoda belcki* Karsch; (135) *C. leptocerca* (Stal); (136) *C. crassicauda* sp. n.; (137) *C. grillatoria* (Stal); (138) *C. parva* sp. n.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 5. Subgenital plate as in Text-fig. 139.

♀ unknown.

## MEASUREMENTS

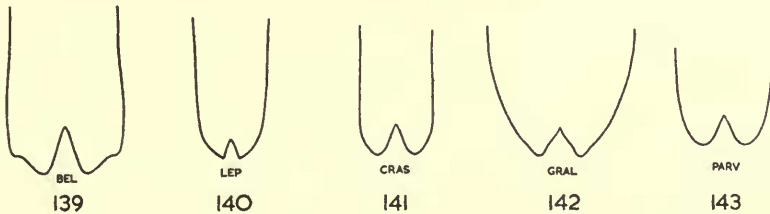
*Males*

Total length (1): 43.6.

Median length of pronotum (3): 5.4-6.0, mean 5.87.

Length of hind femur (3): 29.6-32.2, mean 30.83.

Length of fore wing (3): 30.3-34.7, mean 32.83.



FIGS. 139-143. Ventral view of the male subgenital plate of (139) *Conchotopoda belcki* Karsch; (140) *C. leptocerca* (Stal); (141) *C. crassicauda* sp. n.; (142) *C. grillatoria* (Sjöstedt); (143) *C. parva* sp. n.

DISCUSSION. Males of *C. belcki* Karsch may be easily distinguished from the only other two fully winged species of the genus, *C. leptocerca* (Stal) and *C. crassicauda* sp. n., by the much broader fore wings.

The holotype of *C. belcki* Karsch is lost, but the present species (to which the holotype of *Pantolepta morsei* Karny belongs) is the only species of Acrometopae

known to occur in South West Africa which shows a combination of the following characters mentioned in the original description.

1. The branches of  $R_5$  end on the hind margin of the fore wing (not at the wing-tip, as in *Horatosphaga serrifera* Schaum and *H. stylifera* (Karny)).
2.  $R_1$  is branched near the wing-tip (not unbranched, as in *H. serrifera* Schaum and *H. stylifera* (Karny)).
3. The fore wings are broader than in *Acrometopa* Fieber (those of *C. leptocerca* (Stal) being considerably narrower than in *Acrometopa* Fieber).

It would be very desirable to have a neotype for *C. belcki* Karsch, but I have no suitable specimen available at present.

#### MATERIAL EXAMINED

One ♂ syntype (Windhoek) of *Pantolepta morsei* Karny.

SOUTH AFRICA: Transvaal, Barberton (Edwards) (1 ♂) (S. A. Mus.); Transvaal, Barberton (*Rendall*) (1 ♂) (British Museum (Natural History)).

DISTRIBUTION. This species is known only from South West Africa and Transvaal, but doubtless also occurs in Bechuanaland and perhaps other parts of South Africa.

### 2. *Conchotopoda leptocerca* (Stal, 1876) comb. n.

*Horatosphaga leptocerca* Stal, 1876, *Förh. Kongl. Vetensk. Stockh.* 33 (3): 59. Holotype ♂, SOUTH WEST AFRICA: Damara (*de Vyllder*). In the Naturhistoriska Riksmuseum, Stockholm.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 6. Cerci as in Text-fig. 135. Subgenital plate as in Text-fig. 140.

♀ unknown.

#### MEASUREMENTS

##### Male

Total length: 36.1.

Median length of pronotum: 4.1.

Length of hind femur: 23.9.

Length of fore wing: 28.0.

DISCUSSION. This species may be distinguished from all the other members of the genus except *C. crassicauda* sp. n. by the combination of fully developed hind wings and slender fore wings. It may be separated from *C. crassicauda* sp. n. by the shape of the male cerci and the rather broader fore wings.

#### MATERIAL EXAMINED

♂ holotype.

DISTRIBUTION. *C. leptocerca* (Stal) is known definitely only from the type locality.

### 3. *Conchotopoda crassicauda* sp. n.

Holotype ♂, SOUTH AFRICA: Transvaal, Pietersburg, 1904 (*Faure* (?)). In the South African Museum, Cape Town.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 7. Cerci as in Text-fig. 136. Subgenital plate as in Text-fig. 141.

♀. Venation of fore wings as in Text-fig. 144. Ovipositor as in Text-fig. 145.

DESCRIPTION. ♂. Antennal scrobes reaching above fastigium of frons, which has acute tip. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae. Fore and mid femora without external spinules and without dorsal ridge at apex. Tympanic auricles of fore tibiae not inflated; tympanic apertures slit-like. Hind femora sometimes with about 1-2 ventral spinules. Hind tibiae with about 27 external dorsal spines. Venation of fore wings as in Text-fig. 7.

Tenth abdominal tergite unmodified. Supra-anal plate transverse. Cerci as in Text-fig. 136. Subgenital plate as in Text-fig. 141.

Coloration green except for brown patch on stridulatory organ and sometimes few brown markings on legs and abdomen. Pronotum sometimes with dark spots.

♀. Antennal scrobes reaching slightly above fastigium of frons, which has acute tip. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae. Fore femora without external spinules. Fore tibiae as in male. Mid femora with about 2-3 external spinules. Fore and mid femora without dorsal ridge at apex. Hind femora with about 4 external spinules. Hind tibiae with about 25-30 external dorsal spines. Venation of fore wings as in Text-fig. 144.

Ovipositor as in Text-fig. 145.

Coloration green.



144



145

FIGS. 144 and 145. *Conchotopoda crassicauda* sp. n. (144) Right female fore wing. (145) Lateral view of the ovipositor.

VARIATION. The armature of the legs is variable, and it is possible that some males have external spinules on the fore and mid femora.

#### MEASUREMENTS

##### *Males*

Total length (1) : 34.9.

Median length of pronotum (1) : 4.8.

Length of hind femur (1) : 26.6.

Length of fore wing (2) : 24.9-28.0, mean 26.45.

##### *Female*

Total length : 33.5.

Median length of pronotum : 5.2.

Length of hind femur : 22.6.

Length of fore wing : 26.4.

Length of ovipositor : 9.2.

DISCUSSION. This species is closely related to *C. leptocerca* (Stal), from which it differs in the rather narrower fore wings and in the shape of the male cerci. Males of *C. crassicauda* sp. n. may be distinguished from the remaining species of the genus by the combination of fully developed hind wings and narrow fore wings.

The female specimen bears no data but it can be regarded as being conspecific with the males. All three specimens come from the same batch of South African material, however, and it seems likely that the one species is involved.

MATERIAL EXAMINED

♂ holotype.

One ♂ and 1 ♀ without data (♂ in the British Museum (Natural History); ♀ in the South African Museum).

DISTRIBUTION. Known only from the type locality.

4. *Conchotopoda grillatoria* (Stal, 1856) comb. n.

*Phaneroptera* ? *grillatoria*, Stal, 1856, *Förh. Kongl. Vetensk. Stockh.* 13 : 170. Holotype ♂, SOUTH AFRICA : Caffraria (*Wahlberg*). In the Naturhistoriska Riksmuseum, Stockholm.

DIAGNOSIS. ♂. Venation of fore wings as in Text-fig. 8. Subgenital plate as in Text-fig. 142. Hind wings rudimentary.

♀ unknown.

MEASUREMENTS

*Males*

Total length (2) : 25·8–29·8, mean 27·80.

Median length of pronotum (2) : 6·0–6·3, mean 6·15.

Length of hind femur (1) : 29·8.

Length of fore wing (2) : 21·1–24·1, mean 22·60.

DISCUSSION. This species differs from males of *C. leptocerca* (Stal), *C. crassicauda* sp. n., and *C. belcki* (Karsch), by its lack of hind wings, and from *C. parva* sp. n. by its much larger size.

MATERIAL EXAMINED

♂ holotype.

SOUTH AFRICA : Zululand, Nagana Res. Lab., 1922 (*Curson*) (1 ♂) (British Museum (Natural History)).

DISTRIBUTION. Known only from Caffraria and Zululand.

5. *Conchotopoda parva* sp. n.

Holotype ♂, SOUTH AFRICA : Orange Free State, Witzieshoek, 6,100 ft., 22.ii. 1929 (*Scott*). In the British Museum (Natural History).

DIAGNOSIS. ♂. Venation of fore wings as in Text-figs. 9 and 10. Subgenital plate as in Text-fig. 143. Hind wings rudimentary.

♀ unknown.

DESCRIPTION. ♂. Antennal scrobes reaching slightly above fastigium of frons, which has acute tip. Fastigium of vertex sloping steeply to frons, sulcate above.

Pronotum without lateral carinae. Fore and mid femora without external spinules and without dorsal ridge at apex. Tympanic auricles of fore tibiae not inflated; tympanic apertures slit-like. Hind femora with a variable number of ventral spinules. Hind tibiae with about 20-25 external dorsal spines. Venation of fore wings as in Text-figs. 9 and 10. Hind wings rudimentary.

Tenth abdominal tergite unmodified. Supra-anal plate broad, rounded, flap-like. Cerci as in Text-fig. 138. Subgenital plate as in Text-fig. 143.

General coloration probably green, with dark spots on top of head, pronotum, and parts of femora.

♀ unknown.

VARIATION. The holotype of this species has about 13 ventral spinules on each hind femur, whereas in the specimen from Pretoria the hind femora are unarmed.

#### MEASUREMENTS

##### *Males*

Total length (1) : 24.6.

Median length of pronotum (1) : 4.9.

Length of hind femur (2) : 20.2-22.9, mean 21.55.

Length of fore wing (2) : 20.3-21.1, mean 20.70.

DISCUSSION. This species shares with *C. grallatoria* (Stal) the lack of hind wings but differs from that species in its much smaller size, narrower fore wings, and lack of armature on the fore and mid femora.

The specimen from Pretoria has quite considerably narrower fore wings than the holotype and further material may well show that this species varies geographically.

#### MATERIAL EXAMINED

♂ holotype.

SOUTH AFRICA : Pretoria (*Distant*) (1 ♂) (British Museum (Natural History)).

DISTRIBUTION. Known only from Witziesshoek and Pretoria.

### *LAMECOSOMA* gen. n.

Type species : *Lamecosoma tenuis* sp. n.

DIAGNOSIS. ♂. Body very attenuate, total length about twelve times maximum width of pronotum. Lateral pronotal lobes about three times longer than their maximum depth. Fastigium of frons extending upwards slightly beyond fastigium of vertex. Tympana of fore tibiae each partially obscured by ventral operculum, which is not inflated. Hind wings rudimentary.

♀ unknown.

DESCRIPTION. ♂. Fastigium of frons extending upwards slightly beyond fastigium of vertex. Fastigium of vertex somewhat compressed, narrow, sulcate above.

Pronotum elongate, without lateral carinae, lateral lobes about three times longer than their maximum depth. Fore coxae without spine. Tympana of fore tibiae partially obscured by ventral operculum, which is not inflated. Legs attenuate,

hind femora about eighteen times longer than their maximum vertical width. Hind wings rudimentary.

♀ unknown.

DISCUSSION. This genus (see Text-fig. 3) appears to be quite closely related to *Horatosphaga* Schaum and *Peronura* Karsch. Although the venation at the base of the fore wings does not conform to the pattern typical of *Horatosphaga* Schaum, its nature does give a slight suggestion of it. The facies of the body also shows an affinity with *Horatosphaga* Schaum and a derivation from common stock seems very likely. The male cerci are of the same type as those of *Peronura* Karsch.

Although the female sex of this genus is not known for certain, a female specimen from Morogoro, Tanganyika, may well belong to *Lamecosoma* gen. n. It is very similar in general appearance to males of *L. tenuis* sp. n. and has the slightly greater size which would be expected of a female. Two more females from the Chyulu Hills, southern Kenya, may also belong to this genus. These specimens are again of similar facies, but are rather smaller and could not therefore belong to *L. tenuis* sp. n. All three of these female specimens have a relatively long, gently upcurved, ovipositor.

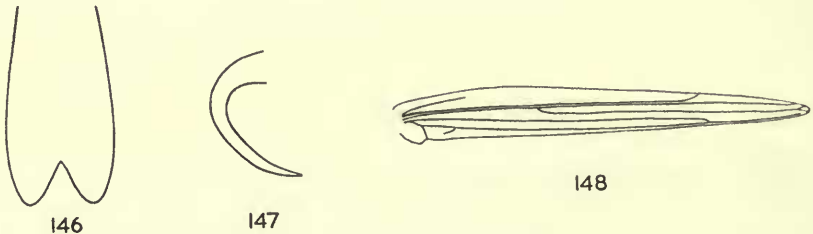
DISTRIBUTION (Text-fig. 44). This genus is known only from the type locality of *L. tenuis* sp. n., but may well occur over a large part of East Africa.

*Lamecosoma tenuis* sp. n.

Holotype ♂, NORTHERN RHODESIA: Kipundu, 21.i.1938 (*Brédo*). In the Musée Royal du Congo Belge, Tervuren.

DIAGNOSIS. ♂. Subgenital plate as in Text-fig. 146. Cerci as in Text-fig. 147. Venation of fore wings as in Text-fig. 148.

♀ unknown.



FIGS. 146-148. *Lamecosoma tenuis* sp. n. (146) Ventral view of the male subgenital plate. (147) Dorsal view of the left male cercus. (148) Right male fore wing.

DESCRIPTION. ♂. Fastigium of vertex sloping to frons, sulcate above.

Pronotum without lateral carinae. Fore femora with about 10-14 external spinules. Mid femora with about 13-20 external spinules. Fore and mid femora with dorsal ridge at apex, ending in spine or point. Hind femora with about 19-22 external spinules; terminal dorsal spine absent. Hind tibiae with about 20-35 external dorsal spines. Fore wings covered almost entirely with dense archdictyon; venation as in Text-fig. 148.



Tenth abdominal tergite emarginate posteriorly. Supra-anal plate rounded, flap-like. Cerci as in Text-fig. 147. Subgenital plate relatively large, shaped as in Text-fig. 148.

General coloration green. Top of head, part of antennae, disc of pronotum, stridulatory organ, hind edge of fore wings, and parts of legs, reddish brown.

♀ unknown.

#### MEASUREMENTS

##### *Males*

Total length (3) : 41.1-43.9, mean 42.77.

Median length of pronotum (2) : 6.2-6.3, mean 6.25.

Length of hind femur (3) : 29.8-30.7, mean 30.27.

Length of fore wing (3) : 33.6-37.1, mean 35.17.

DISCUSSION. In its high degree of attenuation this species resembles *Tylopsis* Fieber ; it differs, however, from this genus in lacking the fore coxal spine and in having rudimentary hind wings. Both the fore wings and the pronotum, moreover, are considerably more attenuate.

Remarks concerning a possible female of this species are given above in the discussion of the genus.

#### MATERIAL EXAMINED

♂ holotype ; 1 ♂ paratype, same data as holotype (British Museum (Natural History)) ; 1 ♂ paratype, NORTHERN RHODESIA : Kipundu, 19.i.1938 (*Brédo*) (Mus. Congo Belge).

DISTRIBUTION. Known only from the type locality.

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